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Wages and Condition of the Hindoo Artizans.

IN these days of social economy the smallest item of information respecting the "condition of the working classes" is possessed of a certain value. The following brief notes, which have reached us from Bombay, concerning the native artizans, are therefore worthy of attention. It is sometimes useful to turn our eye on a lower phasis of civilization; and it is curious to observe the differences which occur in the social development. For the facts here given we are indebted to a native carpenter, who fills the office of a subordinate clerk to the Peninsular and Oriental Steam Navigation Company at Mazagon, near Bombay. In itself his communication is a curiosity; but, as our present object is rather to impart instruction than to create amusement, we shall do our best to exhibit the sense of it.

Few of our readers are unacquainted with the singular division of the Hindoos into castes, and with the pernicious effects which flow from this fatal and superstitious policy. It is probably not so well known that the same exclusive principle is carried out to even a still more absurd extent, if possible, by the native artizans. These people, although sprung from what is considered the lowest and most contemptible order—in the theocratic idea of society—are as devoted to their religion as the Brahmins themselves, and as eager to perpetuate its ancient dogmas. The working classes of India, accordingly, are divided into as many sects as there are castes in their religion. For example, a native carpenter will neither eat nor sleep with a stonemason, nor a brass-founder with a coppersmith. When it is considered how nearly those branches of trade are allied to each other, the absurdity of the principle becomes more apparent. But this is not all. It sometimes happens, in some of the large works in the neighbourhood of Bombay, that the workmen consist of a mixture of Hindoos, Mahomedans, Parsees, and perhaps a sprinkling of Portuguese, all of whom profess different creeds, and hate each other with that perfect hatred which only theological differences can inspire. The old idea of Shylock pervades the whole community: "I will buy with you, sell with you, talk with you, work with you, and so following; but I will not eat with you, drink with you, nor pray with you!"

Another singular feature in the social condition of the Hindoo artizans is this, that every trade is held to be hereditary. If a blacksmith have a son he must make him a blacksmith. The weaver's family, in like manner, must be taught, while they are still infants, to tie the ends of the woof, and, finally, to drive the shuttle after the manner of their forefathers. One generation succeeds an other with almost the blind and undeviating instinct of the lower animals. It is impossible for a man to strike out an original path for himself; for as soon as he is able to lift a hammer or any other implement he must go in with his father and there he must remain.

They serve no formal apprenticeship. In the building trades, for example, a Hindoo boy commences work, we shall say, at the age of ten or twelve years; but until he gets accustomed to the use of tools he gets no wages; and even then he receives next to nothing—perhaps a rupee or two a month—which is increased by degrees, more according to the skill he exhibits than to any stated time or fixed rate. Properly speaking, he is paid by the quantity of work he can execute. It is not at all uncommon to see two lads of the same age working together in a carpenter's or a blacksmith's shop, one getting eight rupees per month and the other getting only six; and it is curious to observe that no symptom of discontent is shown by the weaker of the two.

The standard wages of all mechanics in Bombay, we are informed, is about twenty-six rupees, or 2*l.* 12*s.* per month. In the carpenter's trade, for example, there are three separate branches—ship carpenters, joiners, and carvers,—all of whom are nearly equal in point of wages and regularity of employment; and in this case we may divide the journeymen into three classes, the lowest of whom gets ten, the second twenty, and the third from forty to fifty rupees.* Some men of peculiar genius and skill, who rise to the position of freemen, often earn 100 rupees and upwards per month. The stone-cutters are scarcely so well off in their circumstances, from the reason that there is less demand for their services. They are not settled in shops, like the regular carpenters, but pursue a desultory life under sheds and out-houses, and not unfrequently cutting their stone at the quarry,—or mine, as it is called in India. The highest rate of their wages is about twenty rupees per month. The blacksmiths and copper-smiths, who are highly ingenious mechanics, have shops of their own, where they prepare the articles of hardware, which are exposed in the ironmongers' shops. They are also largely employed in public works and private establishments. In other respects they are on the same footing with carpenters. The plasterers or bricklayers,—these branches are conjoined,—are a numerous tribe, as migratory in their habits as the stone-cutters, and also closely resembling them in their circumstances. The highest wages, in this instance, do not exceed twenty-five rupees per month. The potters are considered about the lowest of handicraftsmen. Their wages in most cases do not amount to more than ten or twelve rupees. Generally speaking they carry on their trade in their own miserable bungalows, separately and independently, and thus become in a manner the bondsmen of the shopkeepers, who have large establishments, and derive large profits from their work. The jewellers, on the other hand, who pursue the same system of isolated labour, scarcely belong to the category of workmen. They have shops of their own, where they sell jewels, as they make them up, to the public, who have a keener scent for cheap jewellery than for expensive pottery. They often realise very handsome profits. The precious-stone cutters are of course similarly placed, with this exception, that there is more irregularity in their employment. Sometimes they engage themselves by the day, in which case they charge a rupee or two, according to the value of the stone, and the quality of the labour.

Under such a condition of things, it is obvious enough that no trades-union could exist. Accordingly, our Hindoo manuscript gravely relates that, "there are no meetings of the working men to settle the rate of wages." "Those rates," it goes on to state, "are fixed by the option of the employers, and the public demand for labour." It is, however, customary sometimes for working men of the better orders, such as coach builders and carvers, to carry on their business in partnership, but whether on the co-operative principle, or that of limited liability, our informant is silent.

With regard to the education of these Hindoo artizans we are informed that it is generally neglected; as, indeed, we might reasonably infer from the circumstance of their being put to work at so early an age, and possessing so little after opportunities of acquiring knowledge. Nevertheless, it is proper to state that numerous instances occur in the trades of which we speak where the men are what even a European tradesman would regard as good scholars. They are far inferior in point of skill to English mechanics; and this is particularly observable when they come in contact at the same work. It must be stated, however, that, in point of ingenuity and power of patient monotonous labour, the Hindoos are unsurpassed.

Some of the ornamental metal-work in their temples is equal to the most elaborate specimens of which we know. The calicoes of Coromandel are in many essential respects superior to those of Manchester. The silks of Moultan, the brocades and ornamental gauzes of Benares, the green muslins of Mysore, not to mention the fabrics of Cashmere, are noble specimens of what a barbarous ingenuity with natural endowments may accomplish. And, we must always remember that the poor Hindoo workman has no advantage from the division of labour, or the use of machinery. His capital for the most part is miserably small; yet, by virtue of sheer personal handicraft and natural taste, his productions are prized over the length and breadth of the civilized world.

It is, however, impossible not to see that under such a system of castes it must be long before the artizans will take their right position in our Indian empire. This wretched principle of hereditary succession must destroy all noble emulation and pride on the part of the workman, and prevent the assertion of individual character. Let us hope that in the progress of things those foolish impediments of which we have spoken may be swept away, leaving free and uninterrupted course to the development of the national resources. The great problem of Indian government is now a financial one, and the solution of it must depend to a large extent on elevating the condition of the native artizans.

* A rupee is 2*s.*

ON CHURCH AND CONVENTUAL ARRANGEMENT.*

IN Germany (Lenoir, ii. 209), at the end of the tenth or beginning of the eleventh century, a modified basilican form appears, at Gernrode, c. 960; Hildesheim, 1001; Limburg, 1035; Mayence, Worms, and Spires.

The type adopted was a double-apsidal cruciform ground-plan, as in the east of France, at Besançon, Verdun, and originally at Strasburg; west and east transepts, a long nave, a short choir, both of three aisles; small round octagonal towers were multiplied, flanking the apses, or attached to both the west and east fronts in churches not cruciform. Polygonal domes or octagonal lanterns were employed at the west end, and at the intersection of the nave and choir, and galleries were constructed under the eaves of the roofs for the accommodation of women.

At Hildesheim we find a short apsidal choir, with an aisle on three sides, not communicating with the nave; a western transept flanked, like the transept, with octagonal towers, and a west door wanting.

St. Gereon, at Cologne, of the thirteenth century, has a circular nave, and is one of the last examples of a domical building. Cologne has a chevet, with seven chapels, c. 1322, five aisles throughout the church, and a partially developed transept. Friburg has a western steeple, found also at Ulm; a low, ill-developed transept, and octagonal towers flanking the junction of the nave and choir, round which are twelve chapels. Strasburg was intended to have two western towers, and the whole east part is a basilica of the eleventh or twelfth century; the transept is ill-defined. Ratisbon, 1275 to the fifteenth century, has three east apses, and a "subdued transept." St. Stephen's, Vienna, as Prague was designed to have, has two transept towers. At Bamberg there are two apses, west and east, flanked by towers. Naumberg is of similar design. Xanten has two western towers, without an entrance on this side, with a polygonal apse, and four flanking chapels opening in the choir and aisles. At St. Severus, Erfurth, three spires rise in place of a transept over the apse.

St. Cunibert's, Cologne, consecrated 836, was the first instance of the Lombardic style in the Rhenish provinces.†

German architecture resolves itself into three periods.

* By the Rev. Mackenzie E. C. Walcott, M.A. See p. 780, *ante*.

† Comp. to Gloss. iii. p. 11; Whewell, Arch. Notes, pp. 46, 78; Petit's Arch., i. p. 82.

The pure Romanesque churches have a semicircular domical apse, lower than the choir (as in several churches at Cologne, Mentz, Spires, Worms, Laach, Eberbach); and frequently the aisles have similar terminations; some churches (as St. Mary Capitoline, the Apostles, and St. Martin), have apses to the ends of the transepts, instead of the usual triple eastern apse; and (at Johannisberg, St. Peter's Gelnhausen, and Laach), the east sides of the transept received semicircular apses. The towers are generally near the east end. There is an apsidal outer gallery round the choir at Laach, Eberbach, Worms, Spires, St. Gereon's, St. Martin's, and St. Mary Capitoline, at Cologne. There are usually two pairs of towers and two cupolas or octagonal pyramids. St. Martin's and St. Castor's, at Cologne, are of this period. A portal cloister, as at Laach and St. Mary Capitoline, Cologne, is another distinctive feature. The sides of the towers terminate in pediments, and in these gables Mr. Fergusson has ingeniously discovered the germ of spire-growth.

In the Transitional or Early German style the apse became polygonal, and of equal height to the choir, and the east chapels of the transept have seldom a simple semicircular form, but have sometimes an additional recess (as at Gelnhausen and Sinzig); or another form (as at Limburg), or wholly disappear with the transept (as at Andernach, Boppart, and Bamberg). At Mentz, Worms; St. Sebald's, Nuremburg, and at Bamberg, the eastern apse is round, and the west apse polygonal; at Bonn the ends of the transepts are polygonal, and the choir apse semicircular. The churches are of three aisles, and often have a polygonal, as at Bonn and Marpurg, or semicircular end to the transept. Generally, where there are double apses, there are west and east transepts, as at Mentz, St. Cunibert's, the Apostles', St. Andrew's, St. Pantaleon's, Cologne; St. Paul's, Worms; and Nuremburg. Two pairs of towers on the east and west occur at Bamberg, Andernach, Bonn, Arnstein, and Limburg. There is a central octagonal tower at Limburg, Gelnhausen, Seligenstadt, Sinzig, Worms, Hermersheim, and Bonn: sometimes there is a central spire between a pair of towers; sometimes two eastern towers (as at Gelnhausen and St. Cunibert's, Cologne); sometimes west towers, as at Limburg, Bonn, Seligenstadt, Sinzig, Hermersheim, and Boppart. A similar group is often found like a transept at the west end, and sometimes a single west tower in the central compartment of this front. The gables of the towers become more acute, and the cornices lighter. Buttresses were used, and porches were added at the west end.—(Whewell, pp. 80, 108, 110.) Chapter-houses are rare in Germany and France, and seldom circular. A baptistery is attached to Meissen. At Worms, also, of the beginning of the twelfth century, there is a west octagonal lantern flanked with round turrets, a central octagon and east end flanked with round turrets. Spires, of the eleventh century, has an octagonal lantern at the intersection, and west square towers to the transepts. Mayence has a western apse composed of three trigonal apses, an octagonal steeple and west turrets, and an east lantern and a round turret. At Laach, c. 1093-1156, we find the ancient parvis before the church with a west cloister, as at San Ambrogio's, Milan; a western apse, used as a tomb-house; a square west tower, with a transept, flanked by lofty circular towers; an eastern transept, a central octagonal lantern, flanked by two square turrets; an apsidal choir, and transepts with eastern apses. Lateral porches supplied the place of a western door. The Apostles', at Cologne, has a tall west tower and transept, a central octagon, and two flanking turrets. St. Castor, Coblentz, Andernach, and Arnstein have two groups of towers, but no central lantern. The third period is the complete or Decorated German, which occurs at Altenberg, Cologne, Freiburg, which has twelve chapels to the choir, and Ratisbon.—(Whewell, p. 113.) At Zurich the choir, of the eleventh or twelfth century, is square, while the aisles terminate in apses, and two west towers were contemplated. A thirteenth century church at Kaschau, Hungary, attributed to Villars de Honecourt, has a French arrangement of eastern chapels. Buda, of the same period, has three eastern apses and two west towers. Roeskilde, in Denmark, of the twelfth and thirteenth centuries, is a three-aisled apsidal basilica, with a western tower. Trondhjem, Norway, is cruciform, with square east chapels to the transepts, and an octagonal tomb-house at the east end; an aisleless nave and central lantern. Hitterdal, a wooden church, is surrounded by external galleries. The cathedral of Lubeck has a three-aisled nave with lateral recesses, an unimportant transept, and a chevet, with seven polygonal chapels and cloister. St. Mary's is three-aisled, has two western towers with no entrance on this side, a low transept, consisting of chapels; and a chevet, with five polygonal chapels. Dantzic is cruciform, with a west tower.

Belgium.—In Belgium the earlier churches had a square east end, and central and western towers: in later times we find, as in Germany, the French chevets; and the arrangement appears also in several Pomeranian churches. The oldest church in Belgium, that of St. Vincent of Soignies, of the tenth century, resembles Zurich: it has a square east end, and had a central and western tower. St. Gertrude, of Nivelles, has also a square east end, a central tower, and west tower flanked with two circular towers, and a double transept. Tournay has a transept, with apsidal ends of the eleventh century; a chevet with five chapels, consecrated 1213; and a central tower, round which four out of the original six lesser towers are grouped. Antwerp has an ill-developed shallow transept, a chevet with five chapels, a seven-aisled nave, and one of the two western towers which formed part of the design. St. Jacques, at Liege, has a circlet of chapels round the choir apse.

Belgian Gothic architecture exhibits—1. Primary Pointed and Transitional, tenth to thirteenth century. The ground-plan is a Latin cross; the principal west door is isolated, and in the Transitional; lateral entrances are made to the nave and choir, but were removed under a single porch, deeply recessed, at the end of the transept in the thirteenth century. Porches at the west end are rare; towers were square: one stood at the west end, or two, as at St. Lambert's, Liége, and St. Sulpice's, Leau; or two flanked the junction of the cross and transept, as at St. Bavon's, Ghent. The principal door was on the west, under a porch, at St. Lambert's, Liége, and St. Mary, Dinant; but on the sides of the nave at St. Vincent's, Soignies, and St. Gervais', Maestricht. The west front, where was no door, had a large window, as at St. Vincent's, Soignies; Notre Dame, Louvaine; and where there are no west towers there are round turrets, as at St. Nicholas' and St. Jacques', Ghent; St. Quentin's, Tournay; and in this case there is a central tower or octagon, as at St. Jacques', Ghent. In Transitional the choir was small, lower than the nave—as at St. Vincent's, Soignies,—square ended, or with a circular or octagonal apse. In the twelfth and thirteenth centuries it was enlarged. Sometimes it is aisleless, sometimes has a chevet and aisles, sometimes has not continuous aisles, throughout its circuit. The naves have no side chapels: the large triforium is painted in Primary and round-headed in Transitional. 2. Secondary-Pointed or Rayonnant, fourteenth to latter part of fifteenth century, is marked by the huge size of the windows above the entrances. The naves have side chapels; Lady-chapels are rare. There are sometimes as many as four doors at the west end, as at St. Gudule's. Recessed porches occur in the fourteenth and fifteenth centuries. Single or double towers flank the west end—square, as at St. Gudule's, or square below and octagonal above, as at Notre Dame, Antwerp, and St. Bavon's, Ghent, but were designed to carry a spire. At the end of the fourteenth and beginning of the fifteenth century they were intricately carved, as at Notre Dame, Antwerp; St. Gertude's, Louvaine; and Mechlin: this was the period of wooden spires, as at St. Gertrude's, Nivelles, and St. Bavon's, Ghent. 3. Third Pointed or Flamboyant, latter part of fifteenth to latter part of sixteenth centuries. Notre Dame, Antwerp, has a fine octagonal cupola,—a solitary instance. Spires became generally spherical or angular domes.—(Weale's "Quarterly Papers;" Schayes, "Hist. de l'Arch. en Belgique.")

Spain.—The Italian apse is a direct copy from the Roman basilica; the Spanish cathedrals present either the French chevet with a circlet of chapels, or an apsidal aisle surrounding the altar, and opening on chapels with an eastern chapel, which, if the east end is square, is the Lady-chapel,—if circular or octagonal, as at Burgos and Batalha, a tomb-house. The transepts are ill defined. The interior arrangement is mainly that of the old basilica. The stalls of the clergy are ranged along the west end of the choir (which is shut off from the nave by a wall), and ranged westward of the transept, the whole space under the lantern—the cimborio—being railed in and unoccupied. The sanctuary (capilla major) contains only the high altar. It is curious to observe in passing that the canons' choir was in the centre of the nave at the Lateran, S. Maria Maggiore, S. Lorenzo fuori le Mure, and St. Clemente; and that the circular font was placed in the north transept at St. Peter's, as the late Baptistery of Canterbury appears to have been built in accordance with that arrangement.

Leon, commenced 1199, terminates in a chevet with five chapels. Burgos, of the thirteenth century, has lateral chapels attached to the nave;* two western towers, a central octagonal lantern, and octagonal eastern chapel, like that of Murcia. Toledo, commenced at the same period, is of five aisles, like Troyes, with an eastern chapel. Seville is a parallelogram, with five aisles and lateral recesses and an eastern chapel.

Portugal.—Batalha (Lenoir, ii. 229), of the fourteenth century, is a three-aisled nave, with a transept, having four eastern apses: to the eastward of the apsidal choir is an octagonal tomb-house, with radiating recesses, and an octagonal tomb-house inscribed in a square.

France.—M. de Caumont divides French Mediæval architecture into (1), Roman; (2), Ogival Primitif (thirteenth century); (3), Ogival Secondaire (fourteenth century); (4), Ogival, Tertiaire, first epoch, 1400-1482; second epoch 1480-1550. In France,† as St. Gregory describes Tours, and Apollinaris Sidonius Lyons, the early churches in the north, Poitou, Auvergne, and Burgundy, as in the sixth century, preserved a basilican form, an apsidal oblong, with an atrium surrounded on the three sides by a colonnade. In one part of Aquitaine, and on the banks of the Rhine, they were aisleless; in Provence and Toulouse the basilica of Constantine, at Rome, seems to have been taken as a model. Fontevrault, of the twelfth century, has the plan of a basilica without aisles. From Auvergne to Nevers and Toulouse, the aisles and upper gallery of the basilica were preserved in the eleventh century. The double apse was found in the east of France, and on the borders of the Rhine; at Tours, Besançon, and Verdun; and, probably, Strasburg. Poitiers has also shallow niche-like apses to the transepts, and three choir alleys. The baptisteries were circular. The naves were at length subdivided by pillars, as at St. Vincent's and Paris, by St. Germain, and at Clermont, by Namatius, the eighth bishop, in the fifth century; in the latter church an apsis was added, and at St. Vincent's, which was called in consequence St. Cross, a transept. Namatius built Auvergne Cathedral in the form of the cross. In France, in place of the wall of the niche-like Roman apse, the architects constructed a screen of columns, with an external aisle opening into radiating chapels—a chevet. The chevet was deduced, probably, from the junction of the circular tomb-house so frequently found behind the altar with the basilica, by the removal of the intermediate walls. At St. Martin's, at Tours, the plan was initiated in the twelfth century by omitting half the eastern circle built by Perpetuus, and building the nave from the tangents, and was fully developed at Conques and Toulouse. Laon, like Dol, has a square end, but in the twelfth or beginning of the thirteenth century, we find semicircular apses to the transepts of Noyon and Soissons, at Tournay, Belgium; and St. Martin's, Cologne. Till the middle of the thirteenth century the churches of the south of France, generally, had neither eastern aisles nor radiating chapels. In Provence, apses were usually polygonal; in the north, circular. M. Viollet le Duc gives some curious instances of a double east apse. The ground-plan is singularly deficient in a due expansion of transepts, which are often wanting, or frequently only indicated internally. Chartres, Beauvais; St. Maurice's, Angers; Autun, Poictiers, Carcassone, and Rouen (the latter strikingly resembling the ground plans of Gloucester and Norwich), are the chief, not to say, almost the only exceptions. Bourges and Bazas are not cruciform, and, like many cathedrals, appear to have been constructed thus in distinction to the abbeys, in order to show that a cathedral was a national monument built by the people. Portals, as at Laon, Chartres, Amiens, Rheims, Sens, Seez, Paris, Coutances, Bourges, and Autum, are very distinctive of French arrangement, and were probably suggested by the large Clugniac porches. Another prominent feature in the thirteenth century is the prevalence of lateral chapel recesses to the aisles, and even when the aisles are double, another distinctive characteristic of the style, built between the buttresses, as at Rheims, Notre Dame, Paris; Troyes and Bourges; and at St. Martin's, at Tours, on the south side of the nave, and to the choir only, as at St. Ouen's, Rouen. St. Front's,

* Fergusson, Handbook of Arch.

† Viollet le Duc, Dict. de l'Arch. s. v. Arch. Rel. Cathedrale; Abside, Chœur, Chapelle; Lenoir, i. 221; ii. 91.

Perigueux; Angoulême, Alby, Fontevrault, and St. Maurice's, Angers, are aisleless. Eastern apsidal chapels occurred in the choirs of St. Front's, Perigueux; Nevers, Angoulême, St. Savin's, Fontevrault; St. Hilaire's, Poictiers; Clement-Ferrand, and Issoire. At Clugny, where there was also a choir-transept, there were double eastern apses to the main transept. At St. Benigne's, Dijon, and Langres, c. 1160, there were mere niches in lieu of transeptal eastern apses. St. André's, Vienne, has an eastern apse; so has St. Maurice's, Angers; Angoulême has four apsidal chapels attached; Clugny had an eastern apse with five chapels; Rouen has an apse with three chapels. A chevet with five chapels occurs at Rheims, Noyon, Tours, Clermont, Narbonne, Limoges, St. Ouen's, Bazas, Troyes, Clugny (now destroyed), Chartres, and St. Martin's, at Tours (Chartres has, however, an additional chapel on the east, connected by a staircase); with three at Fontevrault and Conques, with seven at Beauvais, Bayeux, Amiens, Mans, Coutances, and St. Stephen's, Caen; and with four at Issoire, a fifth of square shape being inserted to the east. Chalons-sur-Maine, Carcassone, and Angers, have an aisleless apsidal choir; Alby is apsidal, with lateral chapels round its entire circuit. St. Front's, Perigueux, as Clugny had, has an ante-church and porch. St. Hilaire's, Poictiers, and Laon, have square east ends; but in the former instance there are three shallow, niche-like apses. At St. Pierre Toscanella's, and at Spires, similar quasi-apses are attached to the transept. At St. Front's, Perigueux, an oblong building, with an apsidal termination, was carried out beyond the choir, like a lady-chapel. At St. Stephen's, Caen, a north-west chapel is attached to the nave.—(Lenoir, i. 275, 355; ii. 24, 95, 121, etc.; Viollet le Duc, i. 4, 232; ii. 423; iii. 226.)

Chapels.—The word chapel has been derived from St. Martin's cappa,* which the kings of France carried out to their wars and deposited in certain tents, called, from the circumstance, "capella." In a chapel of Westminster, Caxton set up his printing-press, a name from this circumstance attached to printers' workshops. The development of chapels requires particular notice. The first churches had but one altar; but in the sixth century, St. Germain built, at St. Vincent's Abbey, four, one in each wing of the cross, besides two additional chapels at the west end. Two centuries later, in the abbey of St. Gall, we find seven, four in each of the aisles, and an apsidal chapel of St. Peter at the west end of the church, in place of the mediana, or principal gate of the basilica. Chapels were first built for the sepulchre of saints. At St. Germain des Prés was an oratory of St. Symphorian, on the south-west of the front, in which St. Germain desired to be buried. On the north-west was the chapel of St. Peter. The cubicula mentioned by St. Paulinus of Nola, were devoted to prayers, reading of holy books, and commemoration of the dead. St. Praxedes, Rome, has two chapels of martyrs, built 817. There is a chapel near the entrance of St. Demetrius Salonica, and another at St. Cecilia Transteverino; one on the south of the choir at Trieste, dedicated to St. Justus and St. Severinus, like the main church, composed of three apsidal alleys. Sens and Langres have a single eastern chapel; Cahors has three, and Angoulême four apsidal eastern chapels. Towards the end of the eleventh century, radiating chapels and an eastern aisle appear in Auvergne and Poitou, and the centre of France, extending in the twelfth century to St. Hilaire's, Poictiers, Notre Dame, Clermont, Nevers, and Toulouse; but in Normandy not until the beginning of the thirteenth century; but ordinarily the choirs in that province and the Ile de France were simply surrounded with aisles, as at Mantes, Poissy, and Paris. Laon and Chartres were almost destitute of chapels. At Bourges (c. 1230) and Chartres (c. 1220) the radiating chapels are mere apsidal niches; but in the twelfth century became important, as at St. Denis, and St. Martin des Champs. In the twelfth and at the beginning of the thirteenth century, chapels, according to an arrangement peculiar to abbeys, and afterwards imitated in the cathedrals, were enlarged, as at St. Remy, Rheims, and Vezelay, and communicated with each other by a subordinate narrow aisle. There are three radiating eastern chapels at Nevers, four at Clermont-Ferrand, five at St. Savin's, and only one on the east at Langres, c. 1160.

The difficulty of ranging chapels round the apse, as at St. Germigny des Prés, led to the alternation or admixture of polygonal or square chapels with those of circular shape, as at Fontenelle; and in the thirteenth and two following centuries to the adoption of polygonal chapels only, as at St. Nicaise's, Rheims. Owing to this grouping of subsidiary apsidal chapels about it, the apse lost its significant name of chevet (capitium). (Ducange s. v. Capitium, ii. 146; Lenoir, ii. 96.) The cemetery of great persons, as at St. Geneviève's at Paris, was on the east side of the apse, and a lamp was often set in a niche, so as to light both this garth and the crypt.

About the eleventh century the altars began to be removed out of the nave into eastern chapels, and the aisles were rendered continuous and enlarged, to afford a free passage round the choir.

In the thirteenth century the lady-chapel, like the radiating chapels of the apse, received a marked development, as at Rheims, Mans, Amiens, and Beauvais, built 1230-70, and at Coutances. The transepts also at length received eastern apsidal chapels, as at Rheims, St. Hilaire le Grand, Clugny, and St. Savin's, as the choir had previously, in order that the altars might be seen on entering the church. To multiply these chapels a second transept was added, as at Salisbury, &c. At Clugny it received north and south apsidal ends, as at Tournay and Noyon, a new arrangement of the eleventh and twelfth centuries. There are double aisles at Clugny and St. Hilaire's.

We are able to collect from the "Rationale" of Durandus, Bishop of Meude, who was born in 1220, and died in 1296, a clear description of a church of that period. It was cruciform, lying east and west, sometimes apsidal, and consisted of nave, chancel, and sanctuary, an apse, a crypt; the roof was tiled; the windows were glazed; the chancel was lower than the nave; there were altar-rails; a screen, and occasionally a rood-loft; a sacristry; a water-drain; there were carvings on the walls of carved images, the zodiacal signs, and Scriptural subjects; there was a veil separating the sanctuary from the choir, to be raised on certain occasions; and in churches "are suspended two eggs of ostriches and other things which cause admiration and which are rarely seen, that by their means the people may be drawn to church and have their minds the more affected." Among the conventual buildings and accessories he mentions a square cloister, chapter-house, refectory, cellar, dormitory, oratory, herb-garden, and well.

In France the naves did not receive their outer chapels (Viollet le Duc, i. 207; ii. 354)—constructed, as at King's College, Cambridge, between the buttresses—until after 1240, and the first instance occurs in Paris, where, in the choir, in 1260, the operation was continued. Limoges, Narbonne, and Troyes were designed without them; Laon, Coutances, Rouen, and Sens were modified for their arrangement, 1300-50. They were added at Amiens about the same period; but in the fourteenth century they disappear at St. Ouen's, while the chevet retains five radiating chapels, the easternmost being most prominent. The outer chapels were probably introduced owing to the enclosure of the choirs.

The architecture of Ireland includes—1. Oratories, as in the south-west district of Munster; and bee-hive houses in Connemara, built of masses of rock, and vaulted with stone of a later period. 2. Celtic, small aisleless rectangular buildings, without an apse, usually in groups of seven, like the churches in Asia Minor and on Mount Athos, with a central west door, and occasionally provided with a chancel, as in the Patrick Temple, Galway, and in the early churches at Glendalough. In the fifth century they are of a type anterior to the Roman basilica; and some were built of timber. 3. Romanesque, ninth to twelfth century, with a basilican arrangement; the throne, or a bench-table, being at the east end, and the altar detached, as at St. Saviour's, Glendalough; the roofs are of high pitch, and chambers are frequently constructed under them, or along the walls, for the clergy. The round towers, at once belfries, beacons, treasuries, and places of retreat, are both of this and the earlier period. That of Glendalough is said to be of the seventh century. Cormac's Chapel, Cashel, has transept-towers of the early part of the twelfth century. 4. Anglo-Irish, from the close of the twelfth century. The original plan of a simple oblong, or a nave and chancel, were preserved to the latest period. Bell-turrets were not common till the thirteenth century. St. Doulogh's Church, of that date, is oblong, with a low square central tower, and adjoins an octagonal baptistry. Christchurch and St. Patrick's, Dublin; Gray, Kilmallock, and Cashel, are Pointed; Jerpoint and Dunbrody, Transitional. Newtown has Romanesque features. Transepts were added in (5), the Later-Pointed. In the fourteenth and fifteenth centuries the narrow central towers were added. Cashel, Kilkenny, Waterford, Limerick, St. Patrick's, and Christchurch are, and Kildare was, cruciform. Their towers were central, with the exception of St. Patrick's and Limerick, which were on the west. There is no instance of two western towers in Ireland. The cloister of Kilconnel resembles cloisters in Spain and Sicily.—(*Gent. Mag.*, N.S. vii. 439; Wakeman, Arch. Hibernica, 1848.)

The architecture of Scotland embraced—1. churches of wicker-work, which in the fifth century, gave way to stone churches, like that built by French workmen at Whitherne for St. Ninian, and another constructed in the eighth century by monks from Jarrow. 2. Scoto-Irish, from the middle of the sixth to the middle of the eleventh century; it exhibited round towers, bee-hive houses, dome-roofed cells, small churches, often in groups, and, at Iona, priests' chambers over the aisle. 3. Romanesque Anglo-Scotish, 1124—1165, as at Dunfermline, Kelso, and Leuchars. 4. Lancet, 1165—1286; Kelso and Paisley had naves shorter than the choirs; Dunkeld, Dunblane, Paisley, Sweet-heart, and Whitherne had aisleless choirs; Brechin, Dunblane, and Witheme were not cruciform; Sweet-heart, Elgin, Pluscardine, St. Andrew's, Aberbrothock, Dryburgh, and Melrose had only an east aisle to the transept. 5. Decorated, 1286—1370. 6. Flamboyant, 1371—1567. The saddle-back tower and polygonal apse are continental features; porches form a characteristic, as at Aberdeen, Paisley, and Dunfermline. Holyrood, Aberdeen, and Dunfermline offer the only instances of two western towers. Dunkeld has, as Glasgow had, a north-western tower. The spires are poor. The imperial crown of Edinburgh is almost unique. The transepts are seldom well developed. Edinburgh has double nave-aisles.—(*Arch. Journal*, xiii. 226).

English Architecture.—The earliest English architecture of which we have any record, historical or material, was neither borrowed from France nor communicated from Germany. The Saxon churches (Poole's Churches, c. iii. p. 22; Lenoir, ii. 180) were divided into four classes (Canute's Laws, A.D. 1017, c. 3). The word "monastery" occurs in Ina's Laws, A.D. 693, § 6. St. Jerome mentions pilgrimages of the early British to Jerusalem. Wearmouth was built by French masons (Monasticon, i. 501). Stone churches are mentioned by Reginald of Durham (Surtus Publ. pp. 282, 284). Florence of Worcester speaks of the magnificence of Alfred's buildings, and Alcuin of York Cathedral: it was, in 627, a square basilica of stone (Ib. Fabric Rolls, p. vii.). Peterborough was built of immense stones, c. 655 (Hugo Can., ap. Leland, i. p. 3). Lastingham was of stone, c. 660 (Bede, Eccl. Hist., iii. c. 23). William of Malmesbury says that stone buildings were rare before the time of Benedict Biscop (lib. i. c. 3). Polished stone is mentioned as employed, c. 674, at Ripon and Hexham. The word "basilica" is used by Eddius, Vit. Wilfridi, c. 17; Matt. Westm. Anno 750; Ordericus Vitalis, ii. p. 25; Will. Malm., fo. 41; Monast., iii. 135. In France it denoted a minster (Ducange, i. 611): in England, a church before consecration (Otho, Const. 1237, c. 1). At Abingdon, the church, like Clermont (Viollet le Duc, i. 209), had a double apse, with twelve chapels and twelve cells for the monks, in the seventh century (Monasticon, i. 512). The dome shown in Anglo-Saxon illuminations (Arch. Jour., vi. 359; i. 24; Jour. Arch. Ass., i. 20; vii. 270; x. 142) links the style with Byzantine. In the instance of Bishop Wearmouth, c. 675, we are informed that the church there was built after the Roman manner. We shall not pause to consider the stud buildings, like that of Glastonbury, but merely allude in passing to the timber church still existing at Greenstead (Jour. Arch. Ass., v. 1; vi. 191); Bury St. Edmund's, till 1032, was mainly of wood (Monasticon, iii. 101). There was a stud Lady-chapel at Tykford (Ib. v. 206). Bede mentions St. Alban's memorial chapel at Verulam, c. 300, as being "of admirable workmanship," and the erection of a stone church at Galloway in 448 gave the name of Whitherne, or Stonehouse, to the place. William of Malmesbury says that St. Aldhelm's "broad church survived whole to that day." St. Piran's Church, in Cornwall, of the fifth century, resembled the Patrick Temple of Galway. The nave door on the south was round-headed, with a chevron moulding, a keystone carved into a tiger's head, and two human heads upon the capitals. The font was octagonal. A single north-east side window, near the priest's door, lighted the east wall of the square-ended chancel; to the south-east was the altar, inscribed with a cross and the name of St. Piran. The stone chancel screen had an opening on the north side. A bench table;

* Johnson, Canons, ii. 66; Durandus, ii. 10, 8; Gemma Animæ, i. 128; Ducange, ii. 103.

commencing on the south side of his screen, was continued round the nave to the east wall. At St. Gwythian's the nave had a south door, a chancel with a stone screen and altar, and a bench table against the north and south walls returned along the screen. St. Madderne's is a simple parallelogram, with a stone bench and division between the nave and chancel, a stone altar, and in the south-west angle a holy well (Arch. Jour., ii. 225; Jour. Ass. Soc., ii. 68). A similar well was found at Kirk Newton, in Durham.

King Edwin built a stone church at York (Comp. to Gloss. iii. 11). St. Augustine introduced the basilican form into England, but without the atrium or narthex. Norwich (Jour. Arch. Ass., xiv.) still retains evidences of a Roman type, where the steps of the bishop's throne appear in the wall behind the altar; at Canterbury the throne once occupied the site of the present altar, while the altar formerly stood on the lower platform; at Exeter the eagle,* until recently, stood in front of the altar steps, being a vestige of the old custom of reading or preaching from that place.

In a history of Ramsey Abbey (Comp. to Gloss. iii. 18) of the time of Henry I., a church contemporaneous with those of St. Dunstan and St. Oswald, is described as having "two towers, one at the west end, the other central, according to the custom of the period." St. Bennet, Hulme, Belvoir, Wymondham, Durham, and Malmesbury, had two similar towers.—(Monasticon, i. 256; iii. 31, 288; Comp. to Gloss. iii. 21.) The western tower was eminently fitted for the defence of the most exposed portions of the church when it was in danger of assault during unsettled times.—(Lenoir, ii. 379; Viollet le Duc, iii. 340.)

Pope Sabinianus directed the employment of bells in 604. Baronius refers their use to the time of Constantine. Bells came from Italy: the large were called *campanæ*, the small *nolæ*.—(Wal. Strabo., c. 4, 5; Am. Fort., c. i.; Fleury, xlviii. 42; Viollet le Duc, iii. 280.) In Scotland, at Aberdeen and Glasgow, the bells were hung upon trees. Bells are mentioned in England by Bede, c. 680 (Hist. Eccles. iv. 23). Turketul, who died 975, gave a bell named Guthlac to Crowland Abbey, and Ingulphus mentions a peal of seven bells there. By the laws of Athelstan the existence of a bell-tower gave the owner the right of a seat in the town gate, a place on the grand jury. Belfries are distinctly mentioned by a monk of St. Gall in the eighth century. One of the earliest bells remaining is that of Moissac, dated 1273. At Chartres (Dr. Billon, F.S.A., sur les Cloches, 1858) some of the bells bore the name of Les Commandes, as they gave notice for ringing the great bells. The same usage was adopted at Bayeux, where similar bells were called Monceaux—warners. At Clugny the bells were named after their destination—Prayers, Angelus, Retreat, Tocsin, &c. That at Strasbourg, used for the assembly of the Council, was called Magistrat; and one at Angers, Evigilans Stultum.

William of Malmesbury describes a church built by Alfred the Great, evidently showing the Rhenish type, as erected in a new way of building; four piers supported the whole structure, which had four round chancels in its circumference. Eddius (Comp. to Gloss. iii. 8, 9), Precentor of Northumbria, describes Hexham, built by St. Wilfrid, as "a structure of many parts, long and high, supported on various columns, and above many subterranean chapels;" and Prior Richard, in 1180, speaks of "its nave surrounded with lateral chapels, its walls divided into three stories, its columns of stone, its crypts and oratories, with passages leading to them, and the coved vault of its sanctuary." He also mentions "porticos (or apses) at Ripon."† Alcuin describes Egbert's cathedral at York as "having many apses and curved roofs." At Winchester, St. Wolstan's Church had north and south aisles, an eastern apse over a crypt used as the burial place of bishops, several chapels, and a cloister to the west; and Elphege, in the tenth century, added a west tower. We therefore gather from these facts that the larger Saxon churches were of stone, with a central tower, aisles, triforia, clerestory, apse, and crypts, although inferior in size and ornament to the Norman period. Bede (H. E. ii. 4) mentions a stone altar set up by St. Paulinus in 627, and similar altars are mentioned by the Council of Epaune, 517, c. 26; Prudentius of Spain, in the fourth century; and Sidonius Apollinaris of France, in the fifth century; and the Excerpts of Egbert, in 750.—(Hierur. Angl. 40; Camb. Camd. Soc. 1845; Canons, 714, c. 41; 816, c. 2.)

The church of St. Martin, at Dover, like St. Généroux, terminated in three equal eastern apses. While we recognise the historical fact that the cruciform shape of churches was one of gradual development, we must at least confess it would be difficult to assign any other reason than symbolical consideration as that which influenced our forefathers in laying out the ground-plan of their churches: and he would not be envied who should attempt to impugn their attempt to embody holy doctrines in external objects, and make the material fabric suggestive of Christian verities. As M. Martin (Hist. de France, iv. 337) observes, "Cet art n'est tout entier qu'une immense aspiration vers Dieu, vers l'infini aspiration ardente et douloureux du cœur." In the tabernacle and temple the form of the edifice, the arrangement of its parts, and the order of its altars and furniture were made by Divine appointment according to a pattern. This model (Milman's Latin Christ. x. 29) in its main features was adopted and adhered to, as far as the different characters of the two dispensations would allow, in the adaptation of heathen buildings and in the positive construction of Christian churches. The doctrine of symbolism, however, must not be pressed too far. The principle of derivation of orientation is very questionable (Proc. Bedf. Arch. Ass. 1856), as far as it turns on the opinion that our Saviour died with his face to the south, or on the direction of the choir to that part of the sky in which the sun rose on the day of Dedication of the Church. The old English Homily on Wake-days (Poole's Churches, iv. 31; Orientator. Symb. of Churches, lxxxviii., lxi.; Churton Eng. Ch. vi. 128), Isidore (Orig. xv. 4), the Gemma Animæ (i. 129), Durandus (v. ii. 27; i. 8), and Walafrid Strabo, mention simply the reason that Christians always prayed towards the east. Viollet le Duc (iii. 235) shows that the declination depended on mere constructional causes. St. Michael's, Coventry, Tynemouth, Boham, Lichfield, and York bent to the south, and St. Mary's, York, and St. Ouen's, to the north.

At Canterbury the Saxon cathedral was arranged in a great degree in imitation of St. Peter's Church, at Rome. In the very ancient church of St. Gall, c. 820 (Lenoir, i. 32; Viollet le Duc, i. 243; Arch. Jour., v. 85), attributed by Mabillon to Eginhard, the architect of Charlemagne, the ground-plan embraced a long nave with screened chapels in the aisles, a transept with an altar in each wing, a short constructional chancel ending in an apse. A screen ran across the first bay westward by the cross, with lateral doors and in front of the ambo. (At Clairvaux the second or outer choir was used by the sick monks.) The ritual choir occupied the space of the lantern, and was furnished with seats for the singers; a western screen ran in front, and had a central entrance flanked by the analogia, one on each side,—an arrangement which reappears centuries later in the double screen to which I shall presently allude, and in the altars attached to the choir screen in Gothic churches. The high altar stood at the top of a flight of steps, on each side of which were smaller altars, and a lesser altar was placed in the apse. In the centre of the nave was the altar of the Holy cross (Lenoir, ii. 17; Monasticon, iii. 80); probably the first instalment of the future rood-screen. The confession, or cell of the saint, lay under the high altar. In each of the western towers was a chapel. The processional path lay between the arcade of the nave and its lateral chapels in the aisles. The doors in the north aisle, led to the porter's room; in the south aisle, to the poor man's hospice; in the south transept, to the cloister, crypt, sacristy, and dormitory; in the north wing, to the crypt, library, scriptorium, abbot's lodge, and guest-house. Canterbury (Willis Cant. Cath., ch. ii.) was a long parallelogram, divided by two arcades into three alleys. At the west end was an apse with the bishop's throne, fronting the lady-chapel altar. Many abbeys were dedicated to St. Peter and St. Paul; the eastern apse was allotted to the altar of the latter in reference to the scene of his labours, and the western to the former, in allusion to the pontifical throne (Lenoir, ii. 7). On each side of the nave was a tower, forming a quasi-transept: that on the north was occupied as the Novices' School, that on the south was entered by a porch, and contained an altar. The choir of the canons was inclosed by a screen breast high; at the upper end was an altar with lateral doors in the screen, which closed it on the north and south. In front of the apse, in the chord of which was the altar of the daily mass, were flights of steps on the north, south, and west, ascending the altar platform, below which was a crypt containing an altar, and extending under the presbytery. Against the east wall of the apse stood the high altar. A passage from the south aisle led into the octagonal baptistery, or church of St. John Baptist.

Edward the Confessor (G. G. Scott, Proc. R.I.B.A., 1860), after "a new kind of building," changed the ordinary Saxon parallelogram into a Latin cross with a lantern at the intersection; the great area of the church had a lofty vaulting; the end had double arches on either side; the choir stood in the cross below the tower; and above and below were little chapels furnished with altars. St. Mary's in the Castle, Dover, built in the early part of the same reign, the latest date assignable, is cruciform and aisleless, with a central tower. St. Edmund's, Bury, completed 1095, had, besides a central tower, two octagonal west towers; the east end was apsidal, the transept had eastern apses, there was a crypt under the choir (Monasticon, iii. 1095).

Ground Plan. — In the Norman and Transitional Norman church, the grand characteristics were the great length of the nave, at at St. Alban's, Winchester, Norwich, Ely, Peterborough, Jorevalle, and Byland: a triapsal arrangement, the choir, shorter than at a later period, ending in an apse,* and the transept having an eastern apse to each wing; the latter feature appearing at Norwich, Gloucester, Romsey, Thetford, Castle-Acre, and Christ Church, Hants. Oxford, St. Cross, and Romsey, had a square east end. The ritual choir occupied the space under the central lantern, and included the first two or three eastern bays of the nave. The apsidal east end, as at Gloucester, Canterbury, Waltham, Leominster, (Arch. Jour., x. 111), and Norwich, often terminated in an aisle opening into one eastern and two lateral chapels. In 1250 aisles were added to the transept of York; and in 1370 a choir transept. Reading had three eastern apses, and two eastern apses in each wing of the transept. (Archæologia, vi. 61). Battle had three eastern polygonal apses (Horsfield's Sussex, i. 539). Wells and Lichfield have polygonal ends to the Lady-chapel. Eastward of the choir was the presbytery, with the altar standing in the chord of the apse, and the bishop's throne elevated on a platform behind it; the circular aisle behind forming a processional path. Apses are rare in the north, probably owing to the influence of Iona. Of a later period we have the "French Chevet," a circlet of pillars, comprising aisle and a crescent of radiating chapels, as at Tewkesbury, Pershore, and Westminster. At St. Alban's the nave waa filled with altars arranged against the piers. The central tower was at length commonly regarded as forming the natural division between the nave and choir; and this recognition, coupled with the introduction of eastern shrines and of a solid rood-screen, necessitated a complete reconstruction or prolongation to the eastward. Under the east tower arch the rood-screen was placed, and a reredos divided the new constructional and ritual choir from the retro-choir. (Viollet le Duc, s. v. Clôture.) Lateral stalls enclosed the choir, and open screens the presbytery; both partitions being inserted in the lower arcades. Access was thus permitted to the entire circuit of the church, without interruption to the choir services; the double aisles of the French churches served the same purpose more efficiently. The obstruction to the progress of a procession offered by the lateral chapels led to the erection of chapels external to the nave-aisles at Chichester, Manchester, Melrose, and Elgin. At Winchester, the reredos, with a more easterly screen, encloses the capitular chapel. At Westminster, St. Alban's, and Bury St. Edmund's, the retro-choir was occupied by the chapel and shrine of the patron saint. Crowland terminated in an apse without lateral chapels.—(Stukeley, Iter. Curios., i. 33.)

Crypt. — The original ground-plans of the eastern portions of churches may sometimes be traced in the early crypts: an apsidal oblong martyrdom at Winchester has its aisles, and a smaller apsidal crypt for the altar to the east.

Crypts were employed as chapels and oratories, charnels (where no distinct charnels were built), mortuary chapels, and chambers to secrete the church jewels in time of danger. They are two kinds, one a square hall, the other a subterranean church, with apses and aisles. They occur at Repton (Jour. Arch. Ass., vii. 263, 275), York (three-aisled), at Gloucester (three-aisled), Christchurch (an apsidal oblong), St. Peter's,

* Durandus, iv. c. xxiv. The eagle of St. John was often carved on the pulpit (Lenoir, ii. 136).

† Comp. to Gloss. iii. 19; Willis in Proc Arch. Inst. 1845, 10—14.

* ἀψίς, a bow. Passow. Lex. Gr.; Lenoir, i. 148, 201, 276; ii. 91; Ducange, i. 31.

Oxford, Bosham, Hythe, and of small size at Hereford (three-aisled), and Exeter, Ripon, and Hexham (Arch. Jour., ii. 239); in the latter two instances shaped like cells. Rochester has a crypt of seven aisles, full of chapels, but not apsidal, begun in the thirteenth century (Jour. Arch. Ass., ix. 279, 281).

At Westminster there was a crypt, as at Wells, with an altar under the chapter-house. Wells are found in them at York and Winchester; at York there is a lavatory. The crypt of Glasgow, of the thirteenth century, extends under and beyond the choir. A similar large crypt at Worcester wants the eastern lesser crypt, but is provided with an additional southern chapel (Britton's Cath.; Proc. Arch. Ass. Worcester, p. 105); and the perfect subterranean church at Canterbury, vividly described by Erasmus, with its iron grille round the tomb, is a three-aisled apsidal oblong, with a transept, having two apses in each wing, and apsidal chapels at the east, while beyond is a second apsidal oblong with aisles, and a round crypt at the extreme east end. The latest English crypt is that of St. Stephen's, Westminster. The apse of a church is generally its most ancient portion, as the choir was always the first part built, and was always rebuilt with reluctance, being devoted to the most sacred offices of religion, and invariably of the strongest construction.

The crypt of Chartres had a martyrdom of St. Denis, with an ambulatory and large chapels (Ducange, ii. 682; Lenoir, i. 209; ii. 157; Viollet le Duc, s. v. Crypte, iv. 447). St. Benigne de Dijon, of the eleventh century, is circular, with an eastern oblong chapel of St. John, and western ante-crypt, with four apses. St. Seurin, Bordeaux, of the eleventh century, is a nave of three alleys. St. Eutrope de Saintes, of the commencement of the twelfth century, is apsidal, of three alleys, with three radiating chapels. At Auxerre, there is an apsidal crypt of the ninth or tenth century, of three alleys, with an aisle all round, opening into a small east apsidal chapel. The reliquary and altar of the saint occupied the east end.

At St. Servais, Belgium, there was a thirteenth-century crypt of three aisles, retaining its altar within the apse till 1806; the second, or *caveau funéraire*, as M. Schayes calls it, remains. A subterranean church of the same period, c. 1078—1092, an oblong of five aisles, with a pentagonal apse, is to be seen at Anderlecht. That of St. Bavon was a square of three aisles (*ib.* iii. 24). The crypt of St. Avit (De Caumont, Rapp. Verb. s. F.A., 1859), of the tenth century, and St. Aignan, a century later, at Orleans, are of three alleys, with a martyrdom or confession under the sanctuaries, and an apsidal church beyond the wall which bisects the entire building.

Glasgow and Llandaff (Freeman's Llandaff) are oblong churches; Canterbury, Lincoln, Salisbury, Worcester, Rochester, Southwell, and Beverley have, like Clugny had, a choir transept; rudiments of a similar arrangement appear at Wells, York, Hereford, and Exeter. Martin (Hist. de France, iv. 338) mentions a similar but exceptional instance at St. Quentin's, but observes that the choir transept is ordinarily found only in abbeys of a period previous to the Ogival style. The stalls of the clergy, probably, reached from the choir transept into the nave (Viollet le Duc, i., 260), the choii transept being allotted exclusively to the clergy, and the western transept to the accommodation of guests. Durham and Fountains have an eastern screen; Peterborough, Lincoln, and Ely have a western screen; Exeter has one in a smaller degree. The choirs of Rochester, Kilkenny, and Christchurch are isolated from their aisles. Dunblane choir is aisleless.

I have been informed that the ground-plans of Minsters* are invariably submitted to the Pope, and that many remain in MS. in the Vatican. We possess, however, the ground-plans of St. Gall, Clugny, Clairvaux, Citeaux, and Clermont, which afford sufficient information for our purpose. The Benedictine (Viollet le Duc, i. 256) arrangement was uniform, a cruciform building with towers and chapels, marked by great magnificence. The Benedictine abbeys generally have a parish church immediately adjoining them.

Austin Canons.—Austin Canons, an order of regular clergy holding a middle position between monks and secular canons, adopted naves of great length, as at Jedburgh, Christchurch, &c., for the purpose of accommodating large congregations (Johnson's Canons, ii. 293; Peckh. Const., 1281, c. 16.), as they were a community of parish priests living under rule; and the prior's lodge is almost invariably attached to the south-west angle of the nave. The east ends are ordinarily square, and the choir—never very large—is sometimes, as at Llanthony (Arch. Camb., i. 201; i. 82, 3rd ser.), and Christchurch, shut off from its aisles. The towers are very seldom of any importance, and are generally additions of a late period at the west end, as at Christchurch (Ferrey's Christchurch), Dorchester (Addington's Dorchester; Arch. Jour., ix. 158), Bolton, and Waltham.*

* The term Μοναστήριον, whence our word Minster, applied to large conventual churches, is first used by Eusebius.—(Hist. Eccles., l. ii. c. 17.)

TOWN SEWERAGE, AND SEWAGE APPLICATION TO LAND FOR PURPOSES OF AGRICULTURE.

THE questions of town sewerage, and works for the application of sewage to land, for purposes of agriculture, are not simple and easy. Town sewering is a complex affair. Some of the items involved are—Site, area, and relative elevation; climate, rain-fall, surface gradients, and character of subsoil; population, water-supply, house-drainage, the use of cesspools, and the relative use of water-closets and soil-pans. Each of these items may be divided, and even sub-divided, fully to treat the question.

A town site may be inland, and the sewage may be taken by gravity over an area sufficient to use up the fluid as a manure; or the whole of the sewage may necessarily be delivered at so low a level as to require to be pumped before any use can be made of it. Then, agricultural land, available for the purpose of sewage irrigation, may be near, or it may be distant; and intervening works may require to be simple, or they may necessarily be expensive.

Steam power must also be estimated from the cost of coals and labour in a district, and I need not tell practical engineers that these elements vary widely in different parts of England. Coals are 5s. per ton in a coal district, and 20s. per ton in many places, where steam-power is required. The cost of lifting water or sewage in any place will be as the head overcome; that is, the vertical height, plus friction. It is of no practical use giving the cost per ton for Croydon, without giving such items also.

Sewage in any town is a varying volume, depending on many causes, but principally on the state of the weather, on the number and strength of subsoil springs, and surface streams. Sewage works—if these involve brick tanks, steam-engines, and underground pipes of cast-iron, for conveyance and distribution of sewage,—must be rigid. If such works are only just sufficient to manage the ordinary flow of sewage, they will be found in practice to be far below the requirements of constantly recurring excesses; and at such times sewage must be lost; and if persons are annoyed or damaged by the escape of sewage past the works of a company, such company may be actionable for this form of nuisance.

Sewage is "rich" or "poor" in proportion to the numbers of soil-pans in use by any population, the numbers using such apparatus, the wealth or poverty of the inhabitants, and to the extent of dilution with subsoil water and with other matter; the power of sewage to fertilize being in proportion to its richness up to a certain point. The richest sewage may have a manuring value (as tested in the laboratory), of 1½d. per ton of fluid; or the value may only be a fraction of a farthing per ton of fluid. Chemists of eminence state the annual value of sewage at 6s. per head per annum, and experience proves that all the nitrogen cannot be used by the plants, even under favourable circumstances.

I have devised and executed plans for the main sewers of some thirty towns, varying in population from 7,000 up to 50,000 each town; and in each town sewers are so designed and constructed as to render the use of sewage easy, when any parties will undertake the application of it to the adjoining land. At Carlisle sewage is pumped from man-holes, previously arranged for this purpose. At Chorley the sewage may be passed over the land below the outlet by gravity; but no one takes up the work. The time is ripe for active work in sewage utilizing: the field is large; and, if no more costly blunders are committed, the work will go on. In the towns sewered by myself I find that in the driest seasons, and at the driest periods of such seasons, subsoil water (spring-water) is always in excess of the water used by the inhabitants, which latter alone can be termed "sewage,"—that is, the refuse-water containing house-washings and soil from water-closets. The spring-water in some towns removed by the sewers is up to twenty times in excess of the volume of water used by the inhabitants. In chalk districts, such as Croydon, excesses of this sort are found.

In England seasons vary in the amount of rain-fall about as one to two; and, in extreme excesses, (thunder storms), as one to several hundreds. The minimum fall of rain in a town may, for one year, be 20 inches: this will be a dry season. The maximum fall of rain may be 40 inches: this will be a wet season. There may frequently be three months without any available rainfall to cleanse the sewers, with occasionally much longer periods of dry weather; and, as in this year of 1860, rain may fall in excess week by week for several months. These are all items in the questions of tanking, pumping, and also for the distributing sewage by the intervention of steam power and cast-iron mains.

Mr. Shepherd brings forward instances of increased value to land, as at "Mansfield, from 3s. to 12*l.* per acre, per annum; in Scotland, to 16*l.*, and 35*l.*, per acre, per annum;" and also states, "from long and careful inquiry, I am clearly of opinion, that, when the sewage is applied to its legitimate use, each person residing in our towns will furnish sufficient sewage annually to irrigate an acre of land in the country." This latter statement is so beyond the mark, that, in my opinion, it is sufficient to invalidate anything Mr. Shepherd can say upon the subject of utilizing town sewage. At Mansfield, and in Scotland, the sewage of many persons is applied to one acre of ground, and is necessary to produce the results set forth in Mr. Shepherd's own letter to the *Times* of the 24th ult.

Water is of value in irrigation, but it will not give a profitable return on the cost of large brick tanks, steam-engines to pump it, and miles of underground cast-iron mains to convey it to the land and to distribute it. I can state, from my own knowledge, that in Croydon (which stands on the chalk formation), spring-water is many times its volume in excess of that which is true sewage. The farmers will soon find it out should they ever be induced to use the fluid on their land.

All experience in sanitary science proves that excess of disease in town populations is intimately connected with foul cesspools, foul sewers, and a foul subsoil. As cesspools have been and are abolished in any town, and as the liquid and soil refuse is speedily removed in water, by sewers, beyond the area of any town; so has the death rate of such town been reduced. The metropolis is a notable example: Worthing, Ely, Croydon, Carlisle, Lancaster, Rugby, and many other places, give favourable results, as vouched by the Registrar-general. Rivers and streams may have been fouled in excess, as the Thames, for instance, in the summer of 1859; but, even with such fouling of our rivers and streams, the gain, in human comfort, and in a diminished death-rate, has been considerable. Take the foul water of our towns to the land, and filter it through the soil in the cheapest possible manner, and then both town and country will be gainers. If sewage, with all its complications of dilution and intervention of machinery, occasional disinfection, &c., is not of sufficient value to farmers to induce them to find the capital, and run the risks indicated; then let the towns pay a sewage disposal-rate, in aid of the cost of works and management. At Rugby the sewage is paid for, but the proprietor has found out, by experience, that the town ought to be payers and not receivers.

At Rugby it has also been discovered that *half* the expenditure, to apply the sewage to *half* the area of land, would have been wiser and more profitable. The population is about 7,000: the area over which the power of irrigation has been extended is some 400 statute acres. The proprietor, by years of experience, finds that 200 acres would be sufficient. Mr. Shepherd would irrigate 7,000 acres,—at one person to each acre;—or, take adults, and say 2,000 acres,—that is, ten times the area experience warrants.

A company may intervene betwixt a town and any agricultural community, and, with economical works and honest intelligent management, be of service to all parties.

Closet and laboratory calculations must be taken with great deductions for practice. Town sewage is generated continuously, and, if used in agriculture, must flow unceasingly on to, over, and through the soil dressed with it. Plants can only take up and assimilate (in certain proportions) any manure, not the whole, but only a part (and most frequently a small fractional part): the

* To be continued.

bulk must therefore be lost, partly by evaporation, partly by surface washing in time of rain; and at all times more or less by subsoil infiltration. Sewage must, therefore, be given to the land in excess, to produce the best and most economical results. Experience has proved this, both in Scotland and in England.

In conclusion I may state that I do not object to the formation of a town sewage company: I only object to wild statements as to the value of sewage, to the collection of a large capital to be expended in works and on salaries; knowing that, if the capital is so expended, there cannot be any profitable return. Railways are useful, but British shareholders, as a body, have reason to think that a more careful expenditure in the first instance would have given more satisfactory dividends. Lead and other mines may either make or ruin the proprietors. It has been said that all the ores raised in Cornwall and Devonshire, if fairly valued, have cost the speculators some 25s. for each 1*l.* sterling of value realised. Town sewage companies may easily expend more capital than they can earn dividend for. The sewage and spring water of Croydon cannot in my opinion pay working expenses and dividend on a capital of 30,000*l.*

With respect to Mr. Walker's letter in the *Times* of the 24th ult., I am not so ignorant as to even wish to imply that the sewage of 30,000 persons can be continuously placed on fifty acres of land: I, however, stated a fact as regarded a sewage utilization experiment at Carlisle.

The area of the land to which any sewage can successfully be applied will depend on the manuring richness of the sewage, and also on the character of soil, subsoil, and mode of cultivation. Sand and gravel are "hungry soils," and will filter and convert, area for area, larger volumes of sewage than heavy clay lands, giving more abundant crops of grass. Deep and close drainage will modify clay lands, and enable them to convert, usefully, larger volumes of sewage. I do not repudiate a judicious use of cast-iron pipes for sewage distribution: they may be used, but not extravagantly. I most sincerely hope no one will persist in saying that I wish to prevent a settlement of this most important question. But, having necessarily been brought into contact with the subject, and having seen existing works and having investigated the cause of some failures, I have found that extravagant expectations on the one hand as to results to be obtained from town sewage, and costly works on the other hand, have landed sewage speculators in failure. It is not advisable that the solidifying process failure at Leicester should be parodied in the liquid form at Croydon. Let the liquid sewage of Croydon go to the land by all means and at once, but in so economical a form that the speculation shall pay.

Robert Rawlinson, C.E.

COLLIERY EXPLOSIONS.

No less than from 135 to 140 out of 200 persons have been killed by the fire-damp explosion in the Black Vein Pit at Risca, near Newport, South Wales, and many of the remainder have been severely injured. In regard both to ventilation and to safety-lamps much still requires to be done on behalf of our poor colliers, whose work is, at the best, one of the most repulsive and slavish kind, and would require every possible improvement to render it even tolerable to any but those who have been habituated to it from childhood. We lately noticed a new safety-lamp invention, in which any attempt to open the encasement of the light inevitably puts it out in the act. Some such invention promises well; for it is often from working with or otherwise using naked lights that such explosions as the dreadful one under notice occur. Where the liability is to "choke damp," as it is called, such an invention would of course be of no avail; but as against the combustible and explosive fire-damp it would be an important aid; although, without adequate ventilation, nothing can suffice to prevent deadly accidents in coal-mines.

Scarcely a month passes but we have dismal accounts of such accidents. Sometimes, as if by the interposition of Providence, only two or three lives are lost: at others the deaths amount to ten, and again to fifty, or one hundred, or even more, as in this sad case. Men and boys, in the prime of health and strength, are suddenly swept away, and widows and orphans created. The *Bristol Post* states that this black-vein pit at Risca, which is 150 yards deep, and the workings of which extend about three miles, has been prolific of accidents during the past fifteen years; that, within that period, first nearly forty were killed; then, eight years ago, eleven were killed; and, five years ago, four or five more deaths took place.

While we sit at home by the side of our pleasant coal-fires, in the dull and cold season, we do not sufficiently reflect on the dangers and inconvenience which are experienced by the hard-worked miners. Apart from deaths and injuries by explosions and by choke-damp, the injury to health and the number of deaths which arise from the ill-ventilated condition of some of these mines are enormous; but we hear less of these than as regards the violent accidents to which that want of ventilation also leads.

When thinking of this, and of the numerous benefits for which we are indebted to the pitmen, who dig, at the constant risk of life, from the deep bowels of the earth, those supplies on which the comfort of our homes so much depends, and without which our steam machinery could not be made, or, when completed, would be motionless and useless,—who dig the black diamonds which are the means of lighting our streets and buildings, and which, to such an important extent, add to the national strength and prosperity,—thoughtful and well-disposed persons ought persistently to inquire if proper care be taken of these miners; or if, in this age, with all our scientific knowledge and mechanical appliances, such loss of life and destruction of health cannot be prevented.

Some of the best and most practical authorities now living are of opinion that, to a very great extent, they *can* be prevented, by the introduction of more certain methods of ventilation, greater care in the working of the seams of coal and management of the waste portions of the mines, and by the appointment of a greater number of persons in the management of collieries who, by education and other good qualities, are fitted for such an important trust.

This is, however, a matter of expense which is, in too many instances, far more likely to be taken into consideration than the mere risk of human life. Such reckless disregard ought not to be allowed; and the matter is well worthy of the inquiry and interference of the Legislature; for there is certainly required a larger amount of intelligent and careful, as well as more general and more constant, inspection of mines, by gentlemen of high attainments, who, by being connected with the Government, may be supposed to be quite independent of the coal owners, and who will act vigorously for the safety of the workmen. Nor should miners be left, with impunity, to pursue the reckless course which they too frequently take at present. By the lighting of a single pipe, it may be, one person will cause the destruction of many. By the opening of his lamp for the purpose of enabling him to get better on with his work,—to enable him see more clearly that he does not mix any slaty matter with the coal, for which he will be subjected to loss in the price of his labour, &c.,—he may also cause an explosion. Admitting this carelessness of the men to be too common, it is clear that, if the ventilation of the pits were thoroughly managed, it would only be under the most rare and extraordinary circumstances that one of those terrible accidents could take place at all. Nevertheless, with improved general arrangements of the mines, measures should also be taken, in connection with the miners, which might be likely to remedy the carelessness complained of. It is probably true, as is stated, that a number of the men who suffered from the recent explosion were found with tobacco-pipes, although this was forbidden; but how could these have been used if a vigilant and proper amount of inspection had been exercised? Perhaps the overlookers themselves were indulging in the same enticing but dangerous practice.

On this point it is worth while to inquire if the "Davy," or "Geordie" lamps are, in all pits, carefully examined, each time they are required for use, by a person of sufficient trust; if the locks which fasten the tops when required for use, in dangerous parts, be sufficiently tested, and of the best design and construction. It is also worth while to ask if it is not possible to improve on the present lamp, by such inventions as that we have alluded to, of a pit lamp which, on the endeavour of a workman to open it, would suddenly be extinguished. Has there been any or sufficient encouragement given, of late years, for the production of an efficient lamp such as this? Pitmen who risk their own and fellow workmen's lives by opening lamps, or even using *lucifer matches*, for the purpose of pipe-lighting, should be subjected to both fine and imprisonment. In like manner, if it can be shown that these lamentable accidents can be lessened by improvements in the mines, and by care or additional expense, the proprietors and managers should not be allowed to go scathless. Some suggest that, if a substantial fine were levied on the proprietors for each life lost, we would soon hear much less of these calamities. We know that many who are engaged in the mining business would, if possible, do right,—that in many instances they are now making exertions for the moral and social improvement of those in their employ; but, in the majority of cases, they do not personally supervise.

ARCHITECTURAL EXAMINATIONS AND THE ARCHITECTURAL ASSOCIATION.

The ordinary meeting of members of the Architectural Association was held on Friday evening (the 7th inst.), at the house, in Conduit-street.

The President (Mr. Roger Smith) occupied the chair.

Mr. Arthur Smith (Honorary Secretary) read the minutes of the last meeting, which were confirmed.

The following gentlemen were, on ballot, elected members of the Association:—Messrs. Georgi, Paraire, Webb, Taylor, and J. G. Goldsmith.

The president said he had to remind the meeting of the course of business, with reference to the question of architectural examinations, to which their attention had been invited by the circular of the Royal Institute of British Architects. At their last meeting, on the 23rd ult., Mr. Arthur Smith moved a resolution, which was in effect that the establishment of an architectural examination might be rendered advantageous to art, and improve the standing of the profession. A debate ensued on that proposition; and, as there appeared to be no prospect of discussing it without going into other points incidental to the subject, the meeting agreed to postpone the consideration of Mr. Smith's motion, in order to consider another bearing on details submitted by Mr. Blashill.

Mr. Blashill observed that when, at the last meeting, he ventured to submit a resolution, that, in the event of a professional examination being insisted upon, it should be confined to subjects connected with the practice of the profession, and that the Association did not consider it desirable that matters of general education should be introduced, he did so from a conviction that the object of the proposed examination ought not to be to test the scholarly acquirements of the candidates in a general sense, but should have reference only to those matters immediately connected with the profession of the architect. He would, therefore, ask the meeting to pass his resolution, the effect of which would be not to disqualify anybody, but to enable gentlemen so disposed to come up to offer themselves for examination in subjects of a purely professional and scientific character, without reference to those abstruse questions which too often formed a stumbling-block to competitive examination in other branches of learning. Since the last evening of meeting he had made a slight alteration in the wording of his motion, which he now begged to move in the following terms:—"That, in the event of a professional examination being insisted upon, it should be limited to those subjects which bear directly upon the practice of the profession, and should not include matters of general education; and this Association is apprehensive that an examination in the principles of beauty would lead to results unfavourable to the progress of art." Appended to this resolution he wished to propose a list of subjects for examination, which should include the properties of materials, the theory and practice of construction, the constructional clauses of the Building Act, and sanitary matters. The history and character of the various styles of art might, perhaps, be added, and an examination into the elementary branches of geology, mensuration, mathematics, and chemistry. A knowledge of the outlines of chemistry would include the nature and quality of materials, and their mechanical properties. Geology would also have a certain reference to kindred subjects,—stone, sand, brick, earth, &c.; and an acquaintance with geometry would be necessary, in order to understand and apply the theory and practice of construction.

Mr. Arthur Allom said that he, for one, would protest against an examination in subjects which would involve what might be termed academical education. He feared that, as no examination but a voluntary one could be instituted, the whole affair would prove a failure.

The president reminded Mr. Allom that the question before the chair was—not whether there should or should not be an examination—but what should form the subject of a proposed examination.

Mr. Allom said that his object in coming to the meeting was to learn the opinions of others, and to give his own. With regard to the subjects named by Mr. Blashill, he was of opinion that many of them embraced matters which it was not absolutely necessary for young men to become masters of. It seemed to him that the whole principle hinged upon the fact, that the cry for improvement came from below instead of from above. The agitation had come from architectural pupils, who maintained that the education offered them was not sufficient to make them competent. The question, therefore, was, not whether the fellows or associates of the Royal Institute were to be examined, because there were associates who were as old as fellows; so that if the Institute were to attempt to force a compulsory examination upon its associates, the step would be fatal to the whole question of examination. He thought the Institute was perfectly right in asking for the opinion of the entire body of architects, for the only way to deal with such a subject was to put it upon the broadest possible basis.

Mr. Kerr (as a visitor, being called on) said he wished to explain the motive which had induced him to attend that evening as a visitor. For many years he had taken a deep interest in the question (and he reminded the meeting that, when the Architectural Association was founded, it was formed upon this very question); and, having reason to think that, owing to ambiguity in the programme of the Royal Institute, their precise intentions were not

thoroughly understood, he had made a suggestion that he should esteem it an honour to be allowed to further the object of the Association by stating what he considered to be the views of the Institute, in order that the discussion might not, so to speak, be misled and prove abortive. At the last meeting of the Institute it was proposed and carried that the discussion of the question should be adjourned for an indefinite period, as they were waiting for the decision of the Architectural Association and for an Association in Scotland. It was clear, therefore, that the Institute could not discuss the matter until after the Christmas holidays were over. Having thus explained the position in which the Institute stood, he hoped the Association would not arrive at any ill-advised conclusion, but give due attention to the subject. The object of the Institute in moving was, that they were of opinion that the time had arrived for the introduction of the educational element into the qualification of an architect. They proposed that this introduction of the educational element should be commenced in a very small manner, in order that they might feel their way, and have nothing to retrace or retract, but go forward. The members of the Association, although for the most part young, would no doubt feel that it was desirable to creep before commencing to run. The council of the Royal Institute had put their views in a very decided form, and the first proposition laid them open to much misunderstanding, in a manner never anticipated. The idea of confining the proposed examination to associates and those who might hereafter become fellows of the Institute was no integral portion of the proposition; because, if the profession decided that an examination should be established, the profession, as a whole, had no particular care about what the Institute might do. He hoped, therefore, that gentlemen would not waste time in considering that portion of the subject.

The President said we consider that the Institute has abandoned that by their vote.

Mr. Kerr.—When the proposition was first brought forward opposition was offered to it, and then the gentleman who proposed it said it should be taken as a whole or rejected as a whole. The Institute, however, refused to adopt that view, for they considered that it was desirable that the proposed examination should be voluntary. The Institute had, in fact, abandoned the compulsory and now confined itself to recommending a voluntary examination. He regretted that the Institute had gone so much into detail as the third and fourth propositions with regard to the curriculum, now somewhat confused, and he had no doubt had, to some extent, misled the minds of the profession. When they found such language as "pure and applied mathematics," and such expressions as "the theory of the beautiful" and "analysis of styles of art and of composition," they might well be misled. As far as he understood, the object of the Institute was to make a complete list, containing not only the propositions made by Mr. Blashill, but other collateral subjects bearing indirectly on the subject; but that the candidates for examination should have the right to select non-essential subjects. He thought gentlemen might perhaps be relieved in their minds when he announced that he had authority for saying that such was the intention of the promoters of the scheme. He agreed with Mr. Blashill that, if an examination be the test of competency, it ought to be confined to essential subjects, because he feared that supplemental or collateral subjects might lead to heartburnings and dissatisfaction, and that gentlemen otherwise well qualified might complain that candidates took higher marks in subjects in which they had not prepared themselves. He also deprecated the introduction of details; and he assured the meeting that the Institute had the matter so much at heart that, in order to prevent misconception, it was quite willing to begin *de novo*. The main difficulty would be to decide as to who should prepare the curriculum; and, although the task would have to be undertaken sooner or later, depend upon it, here it was that the rub would be felt. He therefore advised gentlemen not to trouble themselves about details, but to wait patiently until the curriculum was settled. The Royal Institute was now founded upon what might be called the element of respectability of practice alone. Twenty-five years ago it was the only way to bring the members of the profession together; and it must be admitted that it had succeeded in a very honourable manner, and that it commanded the esteem and was considered the representative of a very large number of the profession. The Architectural Association, on the other hand, was formed on the principle of self-improvement; the students and assistants being fully impressed with the inadequacy of the description of education placed within their reach. They therefore determined to found an association which should for the most part be confined to young men who would endeavour, by a system of mutual instruction, to make up the deficiency of which they complained. Since that time the Association, like most other young societies, had passed through various vicissitudes. He was happy to find that it still commanded the confidence of the junior members of the profession; but he took leave to remind them that their future progress would much depend upon the course which they might adopt that evening. The architectural institutions were, in fact, on their trial. The policy of the Architectural Association had always been education. The respectability-of-practice element of the Institute was not necessary there (in the Association), and consequently there was no rivalry between the two bodies. The profession was not so far gone as to require a diploma in order to distinguish between the "regular and the irregular dustman;" but what it wanted was that its members should be known by education in their practice. Now with regard to the reply to be given to the Institute, there were three courses open to the Association. One course would be, if they did not see their way clearly, to consult caution, and not reply at all. Another would be to go thoroughly into details; and the third would be to treat the question in the abstract, and leave details until a future time, probably a year hence. He thought the Association would best consult its own dignity by dealing with the matter not too much in detail, but generally, in the first instance. He totally objected to the Royal Institute of Architects confining the examination to applicants for its own membership. The profession at large had nothing to do with that; and what they had alone to deal with was that there should be an examination for the public benefit, which should include the whole profession. He had never opposed the scheme of examination; but he thought the council of the Institute ought not to take upon itself functions which belonged to the profession generally. Holding this opinion, he was in favour of leaving the matter in the hands of a special committee, who would investigate it, receive evidence, and report upon it. He felt persuaded the Institute would have to come to that in the end; for he thought the profession would say, "This is a public question, and should be treated by a committee especially appointed with a view to its public character." If this course were adopted, the council of the Royal Institute would get rid of a good deal of the odium attaching to the subject, and the public would be far more satisfied in the end.

Mr. Bunker said he thought the Association had reason to be grateful to Mr. Kerr for attending on the present occasion; for, on their last evening of meeting, there was an opinion prevalent in the room that the examination was to be compulsory, and that any person who did not pass it would be ejected from or tabooed by the profession.

Mr. Paraire complained that Mr. Kerr had come down and told them what they were to do,—a course which he feared would retard the action of the Association, and interrupt that good feeling which had previously existed between the Association and the Institute. He (Mr. Paraire) held in his hand the papers showing the description of examination for candidates for district surveyorships. It seemed to him that they would not be following a bad example if they were to adopt that examination as a guide. On the Continent, for instance, descriptive geometry was an invariable subject of examination; and in his opinion a knowledge of algebra was equally indispensable. He should therefore move, as an addendum to the list of subjects mentioned by Mr. Blashill, arithmetic, algebra, descriptive geometry, drawing,—plan, elevation, and section,—applicable to architectural subjects, and freehand drawing.

Mr. Cates said that, as he had taken a prominent part in promoting a petition to the Institute on the subject, his opinions were pretty well known. He, therefore, merely rose to suggest whether it might be possible to detach the schedule of subjects from the resolution of Mr. Blashill, because it seemed to him that, taking arithmetic alone, an examination into that science might be so conducted that scarcely a single architect in London might be found accomplished enough to pass it. He was not opposed so much to the subjects themselves as to the limit to which the examination into them might be carried; for it would be easy to make an examination so abstruse that it would be next to impossible for any one to pass it who had not devoted immense labour to that particular branch of study. The examination for a district surveyor embraced a very formidable list of subjects; yet it was well known that the manner in which the examination was conducted made it competent for almost any gentleman out of his articles to comply with it. He therefore put it to Mr. Blashill whether he would have any objection to omit from his resolution the list of subjects altogether, as such a course would very much facilitate the object which they had met to accomplish.

Mr. B. A. C. Herring remarked that, on the last evening of meeting, he had expressed himself strongly against examination; but that, in consequence of the explanation given by Mr. Kerr, his views were considerably modified. He begged, therefore, to propose, as an amendment to the resolution of Mr. Blashill, "That it is the opinion of the Architectural Association that a strictly voluntary examination should be instituted, with the view of guiding the student of architecture to such a course of study as would enable him to arrive at competence in his profession."

Mr. Bunker seconded the amendment.

Mr. Rickman supported the amendment proposed by Mr. Herring. He had never entertained a doubt as to the propriety of instituting an examination for young men coming out of their articles, and that it would sooner or later become a necessity, not in consequence of any law of the land, but *ex necessitate rei*,—as an incentive to improvement. If the proposed examination would answer that end, it would be impossible to deny its advantages. Had he been present on the last evening of discussion, he would have suggested the appointment of a committee to select subjects; but he now very much doubted whether many of the subjects enumerated by Mr. Blashill ought to be gone into. The subject, however, was one which, in his opinion, ought to be left to those who were naturally the most competent to express an opinion upon it.

Some desultory conversation ensued; and ultimately Mr. Blashill consented to withdraw his motion for the time, so that Mr. Herring's amendment might be carried; and Mr. A. Smith also withdrew the original motion.

Mr. Herring's amendment was then carried without a dissentient voice.

Mr. Blashill next moved his resolution, which, after one or two verbal amendments, ran as follows:—"That, in the event of a professional examination being insisted upon, it should be limited to those subjects which bear directly upon the practice of the profession, and should not include matters of general education. And this Association is apprehensive that any examination upon the principles of taste might lead to results unfavourable to the progress of art."

After some discussion the resolution was passed, omitting the words,—"And should not include matters of general education."

The schedule including the subjects suggested for examination was withdrawn.

On the motion of Mr. Rickman a resolution was also agreed to,—"That it be an instruction to the secretary to transmit the resolutions passed that evening to the secretary of the Royal Institute of British Architects, and to express the willingness of the Association to enter into the other portions and details of the subject as soon as the Institute should have come to a decision on the essential points of the intended measure.

The President said he entirely approved of the resolution, and congratulated the meeting on the progress which had been made.

It was then announced that at the next meeting (on the 21st instant) a paper would be read by Mr. Blomfield on "The Arrangement of Churches," and that the next subject for the Class of Design would be a grand staircase to a mansion.

Classes for modelling and for instruction in botany have been organized in connection with the Association, and gentlemen desirous of joining are requested to communicate with Mr. H. A. Reeves, 28, Brunswick-square.

FALL OF TWO HOUSES AT KENNINGTON.—On Thursday afternoon two houses in course of erection at the back of Kennington-park fell to the ground with a fearful crash, burying several workmen beneath the ruins. As soon as possible three men were extricated, when they were found to be much injured.

CONNECTION OF HEALTH AND DISEASE WITH THE ELECTRICAL STATE OF THE ATMOSPHERE.

IN a paper by Mr. Thomas Moffat, M.D., "On the Prevalence of certain Forms of Disease in connection with Hail and Snow Showers, and the Electric Condition of the Atmosphere," read at a recent meeting of the Manchester Literary and Philosophical Society, it is stated that in 1852, while deducing results from the meteorological observations of the two previous years, the author observed that an intimate connection existed between falls of snow and hail and diseases of the nervous centres, such as apoplexy, epilepsy, paralysis, and vertigo; and that the results of eight more years bear out the truth of the observation. All observers, he remarks, agree that the air is negative on the approach of great storms, and negative or alternately negative and positive in unsettled weather; and he finds that such storms are almost invariably accompanied by convulsive diseases, or diseases of the nervous centres in some form, as well as by such other forms of disease as premature uterine action, epistaxis, and diarrhœa, with vomiting and cramps. Negative electricity, he concludes, plays an important part in these atmospheric conditions and morbid actions. Hail and snow, he adds, are formed under the influence of opposite electrical conditions.

The subject is highly important, and merits further investigation. We have long been convinced that even common colds are produced by some electrical state of the atmosphere inhaled, and that the action of draughts on the skin is electrical, the continued friction of the current exciting electricity rather than merely producing coldness directly, though the positive electricity, as we are persuaded, is analogous to cold in its contractile tendencies, while the negative is probably relaxing. Ozone and antozone, which are just the vital air oppositely electrified, are believed to have something to do with the production of diseases of different classes, such as influenzas and choleras; and it is many years since a Mr. John Hay, we recollect, published a series of scientific papers at Leith, near Edinburgh, titled "The Seafield Bath Reports," in which he compared the electrical states of the atmosphere with the varying phases of the virulent cholera then prevalent. Were it fully proved what species of diseases (if any) the positive electricity tends to aggravate or to produce, and what the negative, we might perhaps be soon enabled to prevent as well as to cure such diseases, by means of the opposite electricity to that exciting the evil influence. In cholera seasons, if it be the electricity which excites the oxygen of the air into the ozonized state which is defective, thus weakening the scavenging powers, as well as probably acting directly to the injury of the human body,—might not the worst localities, such as close courts and dwellings, be even frequently re-electrified, directly, by means of so potent an agent as the electrical steam boiler, of Sir William Armstrong's invention? Electricity of the right kind could, of course, be still more readily applied to the patient's body; and it might be that even those "colds" which are often so difficult to remove, and so deadly in their ulterior effects, would thus be removable, as if by magic. The medical and scientific worlds do seem to be here on the brink of important discoveries.

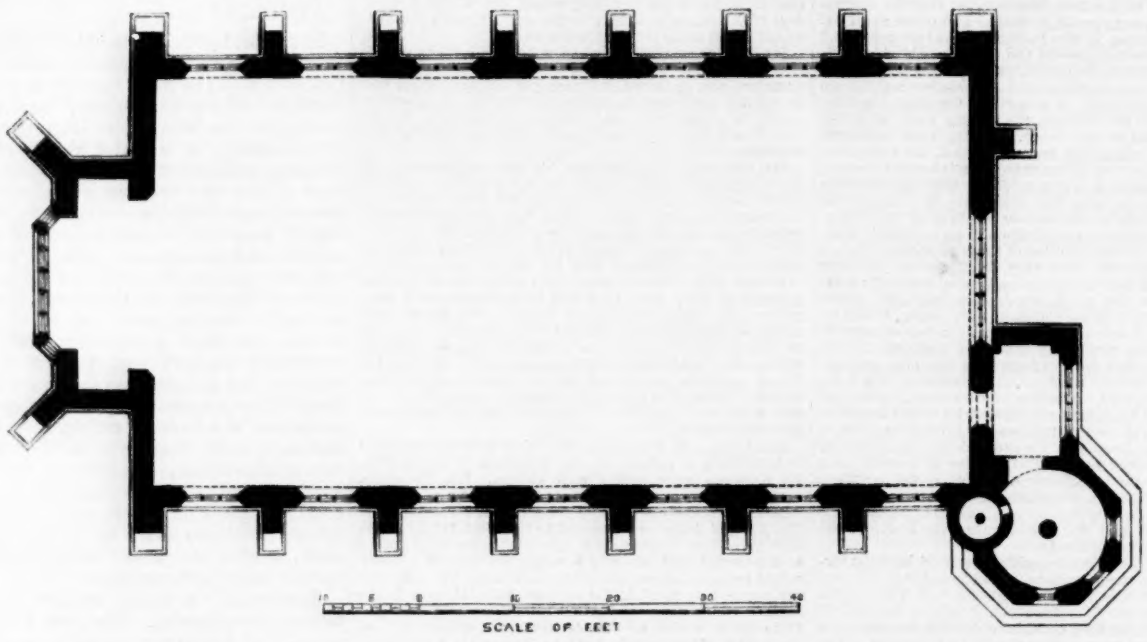
FRANCE.

THE Monceaux Park, the greater portion of which is about to disappear, was at the end of the last century one of the wonders of the capital: the Parisian folk delighted in admiring its pavilions of all sorts of architecture, grottos, kiosks, imitations of ruins, rivers, islands, Greek temples, winter gardens, &c. In one portion of the park there was a windmill, with a rustic habitation for the miller: this fantastic hut contained a dairy, with all the milk-pans in the finest porcelain, and the walls were lined with Carrara marble. Of all this nothing now remains but the *débris* of a colonnade, which formerly constituted a rotunda without covering, an ancient statue standing in the centre.

Henceforth, says the *Siècle*, this park will be for the most part cut up into small lots, whose limits are already set out; but that portion which borders on the Rue de Courcelles will form a square likely to rival any of the metropolis.

The "Impasse des Peintres," and the adjoining house, which is to be cleared away, for certain proposed improvements, are on the site of one of the gateways of the town under Philip-Augustus. This portal, known under the name of Porte Saint Denys (in olden times), took another

NEW LIBRARY, MIDDLE TEMPLE.—*Plan of principal Floor.*



under Charles V. It was decorated, as well as the other gates of Paris, with a statue of the Virgin.

The Impasse des Peintres derives its name, according to Sauval, from the fresco painters inhabiting the locality: others say that a master-painter, Guyon Ledoux, built there, in 1535, a house with a corbelled turret: some existing documents, however, show that, in 1303, the Maison de l'Arbalite belonged to the descendants of one Gilles Lepeintre.

Of the thirty-one properties expropriated three were arranged amicably: out of 113 shops of different sorts and industrial establishments, seven were compensated by mutual contract. In summing up the following figures occur: offers by the town of Paris, 4,603,620f.; claimed by owners and tenants, &c., 9,703,812f.; awarded by jury, 5,972,700f.; difference between demands and awards, 3,821,112f.; difference between offers and awards, 1,369,080f.

At Luz-Saint-Sauveur the works for the construction of the new Napoleon bridge are actively progressing. The Minister of Public Works has obtained the services of one of the British colonists near Bagnères-de-Bigorre, Mr. Lyte, an artist and skilful photographer, and has engaged him to make proofs of the works at different stages. These photographs are despatched at once to the Minister, who can report on the general progress without going into details only to be arrived at by complicated measurements and a mass of descriptions.

THE MOVEMENT ON THE CONTINENT FOR IMPROVING THE DWELLINGS OF THE WORKING CLASSES.

The following is an extract of a letter from Professor V. A. Huber, of Wernigerode, in Prussia, addressed to Mr. Henry Roberts, F.S.A.:

The best thing by far on the Continent in this direction is the *cité ouvrière* at Mulhause, in France, which, in October, 1860, had not fewer than 560 excellent dwellings, with gardens, and of which 364 have been sold to working men, after the excellent system by which the occupier may become the owner of his dwelling. Besides the houses there are a washhouse and bath, restaurant, reading-room, bakehouse, lodging-house for single men, a school for children, an inn, or house of call for working men on the tramp; and it is in contemplation to provide the *cité* with a physician and a nurse. There is not the least difficulty in getting 5 per cent. on the capital, though the shares pay only 4 per cent.: the capital raised by loan is at 4½ per cent.

To see this neat suburb of Mulhause rising like enchantment in a few years,—to see it on a fine summer Sunday, with the gardens in full blossom, roses without end, and the people as decently and homely merry as heart can wish,—and to compare this with the condition in which the writer has known them, some twelve years since, and in which the large mass of the mill-people may still be seen here and elsewhere,—to see the 364 mere proletarian *ouvriers* transformed (with their families) into thriving *ouvriers propriétaires*—is a grand sight indeed. One peculiarly French trait is, that not a few young men, after having served their time, or not being yet called, enlist as *remplagants*, and with the money they get buy a house in the *cité* for their aged parents.

ARBITRATION, SHEFFIELD WORKHOUSE.

A difference arose between the Sheffield Guardians and Mr. Harrison with regard to his contract for joiner's work in the workhouse alterations. The amount of the charge in dispute was 200*l.* An arbitration was agreed on and the award has been made. The arbitrators' costs and charges amount to 100*l.* 10s. The arbitrators have given a decision adverse to the guardians. Mr. Harrison's original contract was 1,020*l.*, and during the progress of the work he appears to have drawn 800*l.*, leaving a balance of 220*l.* From this sum the guardians proposed to make a reduction of 200*l.*, leaving 20*l.* only as due to the contractor. Mr. Harrison objected to this; and the result was that Mr. Charles Unwin, Mr. John Frith, and Mr. T. J. Flockton were called in as arbitrators. We are informed that they decide that the guardians are to pay 313*l.* 14s. 10d., being 93*l.* 14s. 10d. in excess of Mr. Harrison's original account. The award also fixes the guardians with the costs of the proceedings, making a total order of 414*l.* 4s. 10d., exclusive of the charges of their own solicitors, and other items, which the arbitrators order each party to pay on their own account.

IRELAND.

A new Gothic drinking-fountain is in course of erection on the Custom-house quay, Dublin. His excellency the lord lieutenant is the donor. Messrs. Purdy & Outhwaite are the contractors.

The new Decorated chapel and other extensive works in connection with St. Vincent's hospital, Stephen-green, have just been finished at a cost of 1,200*l.* Mr. J. Beardwood, was the contractor.

The building surveyors of Dublin are about to form an association for the purpose of "protecting themselves against the irregularities of unqualified practitioners, whose proceedings are calculated to bring the profession into disrepute."

A new R. C. church is about to be built in the parish of St. Michael's, Limerick.

The Berwick drinking-fountain in Cork, and that in Limerick, presented by Mr. Ryan, the late mayor of that city, have been erected. Another, the gift of Mr. Malcomson, is in progress.

On Wednesday, November 21st, the opening of the new orphanage of St. Vincent de Paul, at Glasnevin, took place. The architect was Mr. S. J. Butler; and the builder, Mr. P. Myers.

The new building for the Jesuits at Miltown-park, near Donnybrook, has just been completed. The building stands on 25 acres of land, and consists of two four-story wings, 40 feet by 65 feet, connected by a two-story building, 64 feet long, containing a chapel and refectory. The height of the wings from the ground level to the coping of prrapet is 50 feet. The designs show a front of Italian character, but in the erection of the building they have been departed from. The total cost of new works was about 4,700*l.* The designs were furnished and the works carried out under the superintendence of Mr. Charles Geoghegan; Mr. John Rooney, builder.

A new lunatic asylum is about to be built near the town of Letterkenny, co. Donegal.

A bronze statue is about to be erected in Cork to the late Alderman Fitzgibbon. The town council are to grant a site in Patrick-street, or some other suitable spot. A drinking-fountain is also to be constructed in connection with the statue.

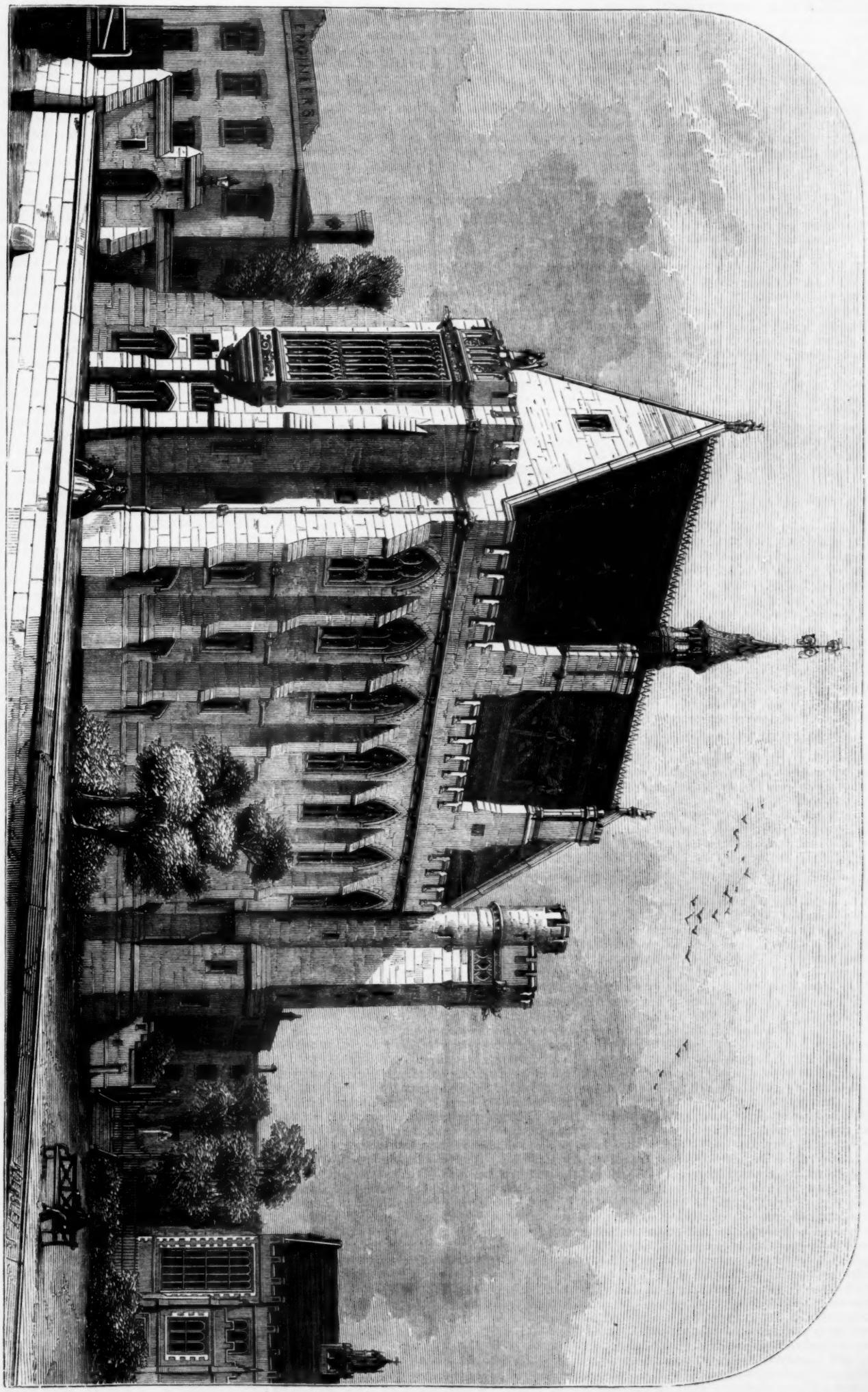
NEW LIBRARY, MIDDLE TEMPLE, LONDON.

In our volume for 1858 (p. 567), it is recorded, with other particulars, that the first stone of the New Library was laid by the late Sir Fortunatus Dwarris, on the 16th of August of that year. The strike delayed the works, but the building is now nearly completed, and we give in our present number a view of it, and the plan of the principal floor,—the library proper. This apartment, which may be called 96 feet long, including the oriel, 42 feet wide, and 63 feet in height, to the underside of the ridge, is covered with a hammer-beam roof, after the fashion of that in Westminster Hall. In fact, when it is looked at from the south end, the window in the north end, not seen in our view, being also very like the great window in Westminster, the likeness is disagreeably striking. The library is warmed with Perkins's hot-water pipes, and the floor is laid with cement, in stone margins. The side windows and that in the northern end are filled with stained glass, by Messrs. Ward. The latter, containing the arms of Templars, is a rich piece of colour.

Below the library are two stories, introduced as a commercial speculation, with more advantage in a pecuniary point of view than to the appearance of the building externally. These chambers are not, as is generally supposed, for the temporary reception of persons overcome in the library by the somnific influence of study; but will be let to any parties who wish to reside or carry on business in the Temple.

Mr. H. R. Abraham, it will be remembered, is the architect; Mr. Geo. Myers the contractor. The carving was executed by Mr. Ruddick. Mr. Brodie (who succeeded the late James Rowland) is clerk of the works.

The building is wholly of Bath stone externally; and the cost, including the book-cases, will be something under 13,000*l.*



NEW LIBRARY, MIDDLE TEMPLE, LONDON.—MR. H. R. ABRAHAM, ARCHITECT.

CHANGES IN TRADE.

THE FRENCH TARIFF.

GREAT distress, it is to be regretted, exists at the present time amongst the ribbon weavers of Coventry, and those engaged in departments of the silk trade, in Spitalfields: some other branches of trade are also depressed. Nevertheless, the general trade of the country is in a satisfactory state; and, doubtless, the new Anglo-French treaty will be the means of giving increased scope to British industry. It is, therefore, most desirable, at the present time, that both masters and workmen should endeavour, as far as possible, to take the opportunity which is presented by the reduction of duty on many articles of British manhfacture.

Amongst some of the most important items of this treaty, it may be noticed that the duty has been entirely taken off, from between forty and fifty chemicals: amongst them are the various acids, oxides of iron, copper, various preparations of potash, &c. &c.; also earthenware and pottery, including tiles of all kinds, bricks, fire-bricks, gas-retorts, drainage-pipes, and others; crucibles of all sorts, including those of plumago, or black-lead; clay-pipes, glazed or not, of all shapes.* Stoneware utensils, and apparatus used in the manufacture of chemical products, are all to be admitted into France duty free. Common ware of all sorts, flat and hollow ware, including bottles, flasks, household articles, kitchen utensils, &c., will be charged 4 francs per 100 kilos. This will cause increase in trade. Amongst the other articles from which the duty has been removed are broken glass and cullet; rock crystal, rough or worked, if unmounted; wool, raw, Australian, imported from British entrepôts; cotton, raw, imported direct from British India, and from British entrepôts, in British or French vessels. Several vegetable fibres are also free; so is silk in cocoons, raw or thrown. Slates for roofing are charged 4 francs per 1,000; in squares or slabs, 10 francs per 100.

Tissues, hosiery, and lace, of pure silk, are free: crapes, called English unbleached, and lace of silk, black or coloured, and net, are reduced to 10 per cent. in 1860: in 1864 they will be free. In connection with other matters, a considerable reduction of the French duty will open a market which has hitherto been closed by the old restrictions; and such will be the mutual advantages, that a still further decrease will be soon found desirable. So great a change cannot be made without for a time pressing on some classes: the evil will, however, not be met by the opposition or disputes of masters and workmen. The strike of the ribbon weavers, at Coventry, has lead to no good result: on the contrary, we fear that it has been partly the means of bringing distress upon a large number of respectable and industrious families. Many blame the new tariff for this. It should, however, be remembered, that it is the change of fashion which has been the chief cause of this trouble. At the present time ribbons in the bonnets and dresses of the ladies are but little used in comparison with the quantity in demand a few years ago; velvets, feathers, and other kinds of ornamentation being employed instead. Otherwise, we believe that, by improvement of our skill in the design of the patterns of these articles, with the advantage of steam machinery, &c., we should soon have been able to compete in this way with the French. It has been suggested, in order to check the distress of the ribbon-weavers, that, if every woman in England were to purchase but one yard of ribbon, it would make a vast improvement in the trade. No doubt the ladies of Great Britain feel heartily disposed to relieve the sufferings of this or any other body of honest workpeople: it may however, be feared that this plan will not be of any permanent benefit, for it is difficult to turn the tide of fashion.

Many remember the days when brass buttons of several descriptions were so generally in use. Some thousands of persons depended on this production for a living. Covered buttons became the rage, and in a very short time there was scarcely a brass button to be seen. Deputations from the unemployed workmen were received by personages of distinction, presents of brass buttons were offered, and benevolent gentlemen persisted for a time in wearing the old style. This, however, was of but little avail. The trade of the brass button maker became profitless, and many were reduced from a comfortable position to one of poverty. It may be hoped that the cloud which has come over the ribbon trade is but temporary. The season has been unfavourable; and other things are to be taken into account which should encourage brighter hopes for the future. There is unfortunately a want of inclination on the part of workmen, when the demand for a particular kind of labour has ceased, to undertake some other. At the time of the change from stage coaches to railway carriages many of the most respectable of the guards and coachmen were offered situations in connection with the railways: only a few accepted them; and, in many cases, these poor fellows ended their days in the workhouse.

* Glazed pipes, with decorations, in relief, of one or more colours, flat or hollow, are charged 5 francs per 100 kilos.

THE LONDON COSTERMONGERS.

So officious and troublesome has become the persecution of these street dealers by certain authorities in the City, that a meeting of the costermongers and their friends has been held, at which their grievances were very fairly argued. It appears that there are about 50,000 of these dealers in London; that about 10,000 of them are married, and have an average of five children each; so that if we add 50,000 children, 10,000 wives, and 50,000 others, we find that the number of persons depending on this street trade amount to 110,000. We have had many opportunities of judging the character of this large body of the London population, who have generally been driven to this kind of life, and we have noted the great industry of the majority.

As a matter of certainty, there are some of these men and women very rough in manners, and perhaps not very fastidious in certain matters; yet generally we have seen much to be commended in the class; and to them not only the dealers in the market, but the dwellers in the poorer districts, are much beholden. Therefore, while it is necessary to keep the thoroughfares clear, we should be sorry to see a spiteful spirit shown towards them.

PROVINCIAL NEWS.

Stewkley (*Bucks*).—The new schools lately built here, at a cost amounting to nearly 1,000*l*., have been opened by the Bishop of Oxford.

Brighton.—The prospectus has been issued of a Brighton Hotel Company, with a capital of 75,000*l*., in shares of 5*l*. each, the promoters being in negociation for an eligible site on the West Cliff. The hotel will contain 200 bed-rooms, and accommodation for private families.

Parkhurst.—Improvements have been made at these barracks. A gallery has been erected, besides other improvements having been effected. The contractor for erecting the married soldiers' quarters, according to the plan of the Secretary-at-War, Mr. Sidney Herbert, has commenced preparing for the foundation for the building, which is to be placed at the western end, and facing the parade ground, which is also in the course of restoration. A well for the new barracks is now digging, and which it is calculated will reqnire to be carried to the depth of 300 feet before a sufficient supply of water will be obtained.

Worcester.—Another step in the progress of our street architecture, says the local *Herald*, has been taken by the erection of a shop at the corner of Broad-street and the Cross. The proprietors are Messrs. Spriggs & Co. It has been efected by Mr. Hemming, builder, Lowesmoor, from the designs of Mr. Rowe, of this city, architect, and is of brick, with stone dressings. The shop has a long front, occupying the corner of Broad-street and the Cross. It is composed of plateglass set in brass frames, and forming a series of windows in both streets, with an entrance in the angle. The shop and principal room above are illuminated at night by circles of gas-jets, disposed in sunlight pattern, with cut crystal pendants. The house is probably the loftiest in the city, and Mr. Spriggs has given the public the benefit of a considerable addition to the width of the footpath.

Malton.—The works for laying down a system of large drainage pipes along the streets of Malton are being proceeded with. The drainage, from the nature of the ground on which the town is built, has a great inclination to the river, and the trunk drains are being laid 12 feet deep, in order that the cellars and kitchens may be drained if required. The work is estimated to cost about 1,500*l*. The adjoining town of Norton is also under a survey by Mr. Jno. C. Wise, who is nearly ready with the sections, &c., with a view to the drainage of that place, which at present is very defective. Both schemes are under the control of the Malton Board of Health.

Bristol.—New schools connected with St. Clement's Church have been opened. The buildings consist of schoolroom, 70 feet by 22 feet; class-room, 16 feet by 14 feet; with teachers' residence, all in the Early Decorated style of architecture, from the designs of Mr. S. B. Gabriel, of Bristol, architect, and cost 1,400*l*. The design has been carried out by the following contractors,—King, mason; Lawrence, carpenter; Melsom, plasterer and painter.

Leeds.—An extraordinary general meeting of the Leeds Philosophical and Literary Society has been held, to receive the report of their building committee, and to decide upon some means for carrying out the proposed additions to and alterations in the hall of the society. The chairman explained that two sets of plans had been submitted to the committee, and one had been chosen. According to the selected plan the estimated expense, in all, was 2,662*l*. The committee, however, felt strongly that a new elevation would be required, the cost of which would amount to 540*l*. Thus there were 3,202*l*. for the inside and outside of the old and new buildings. In order to carry out the plan an additional sum of 1,200*l*. would be wanted. After some discussion the following resolutions were carried:—"That it would be desirable to carry out the plans produced, and adopt the improved exterior elevation as well as the internal arrangements, provided the requisite funds can be obtained; and that for that purpose the subscriptions should, if possible, be raised to 8,000*l*.;" and "That the general committee be requested to continue their services, and, if the required fund can be raised, to proceed with the execution of the work." The plans selected have been proposed by Messrs. Dobson & Chorley.

Hull.—The Hull Park Committee have decided that the People's Park should be laid out at a cost not exceeding 5,000*l*., exclusive of planting the trees. Mr. Pearson (ex-mayor) has made arrangements with Mr. Earle, the sculptor, for a marble statue of her Majesty, to be erected in the park. A subscription is at present on foot in Hull for raising a statue to Mr. Pearson, the donor of the park.——A new company has been formed here, in order to construct a large dock on the west side of the town. The old dock company have issued a report, in which they virtually announce their intention to oppose the scheme in Parliament, and to apply for power to construct a dock themselves of a similar character.

CHURCH-BUILDING NEWS.

Walton (*Bucks*).—The church of Walton St. Michael has undergone a general reparation, and been reopened. The restoration of the nave was intrusted to Mr. Scott, that of the chancel to Mr. William White, under whose auspices also the ancient rectory has received enlargement and some interior polychromatic decoration. The old unsightly pewing, which crowded up the nave of the church, has given way to open benches. The choir has been simply fitted in oak. The pavements of the sacrarium and chancel have been relaid with tiles in plain colours, intermixed with the old stone paving. A new communion-table, rail, and sedilia have been provided. The east window has been repaired and glazed with stencilled quarries by Messrs. Lavers & Barraud; a new vestry added on the north side of the chancel; and a choir organ, by Mr. H. Willis, erected—partially recessed in the wall—with the key-board fitted into the stall-desk.

Wolverton.—The new church at Stantonbury, which has recently been erected for the accommodation of the large population connected with the works of the London and North-Western Railway at Wolverton, has been consecrated. The edifice is situated about three-quarters of a mile from the Wolverton station, on the west side, and is built of stone, in the Decorated Gothic style of architecture, from the designs of Mr. Street, of London. The tower and spire, which are intended to be raised to a height of 156 feet, are left unfinished from want of funds. The interior is without galleries, and has an open-timbered roof, with aisles, and unenclosed seats, instead of pews. The walls are of Cosgrove stone, with Ancaster dressings, the marble pilasters supporting the arches being of a dark red colour. The stone pulpit occupies a kind of recess on one side, and bears an inscription to the effect that it was presented by the foreman and workmen at the Wolverton factory. There is also an octangular stone font, the gift of the Marchioness of Chandos, the wife of the chairman of the North-Western. The entrances and floor are paved with tiles. Mr. Mills, of Stratford-on-Avon, is the builder of the church, which, it may be added, contains sittings for nearly 500 persons. The cost of the structure, so far as it is now completed, has been 4,430*l*., of which

sum the shareholders of the London and North-Western Railway have contributed 2,560*l.*, and persons locally interested, and others, 1,870*l.* A further sum of 1,000*l.* will be required to complete the spire and the upper part of the tower. A burial-ground surrounds the church; and nearly contiguous to it are school-rooms, large enough for 400 children, which have now been in use for a considerable period.

Southborough.—St. Thomas's Church, erected at a cost of 2,400*l.*, has been consecrated. The edifice was completed about fourteen months ago. The design is in the Early Pointed style of architecture, and the materials used are the Kentish rag and Bath stone. The building consists of a nave, north and south aisles, and chancel with north and south aisles, an organ-chamber, south porch, and vestry. A clerestory, with eight cinquefoil windows, serves to light the upper part of the nave, and terminates at the west end of the building in a doublebell gable, beneath which is a couplet of lancet windows divided by a massive buttress extending from the bell gable downward, and terminating at the base in a western doorway. The remaining windows throughout are of a simple character, disposed in lancets, trefoil-headed and soffit-cusped. The roofs are covered with slates from the Bangor and Talacre quarries, disposed in ornamental patterns. Internally the church is of Calverley stone, with alternated round and octangular piers, arches and dressings, of that material. It is arranged to accommodate upwards of 300 on the ground-floor, with open seats of deal, stained and varnished, as are the exposed timbers of the open roof. The architect is Mr. F. Hyde Pownall, of London; and the works were executed by Messrs. Jackson & Shaw, of Westminster.

Salisbury.—The memorial church to George Herbert, the poet, has at length been erected, in his own parish, Bemerton (a village in close contiguity to the city of Salisbury). The church stands on a site near the edifice where he formerly ministered and lived, and beneath the altar of which he was buried. Thursday, the 13th of the present month, is fixed for the consecration. It is not intended, for obvious reasons, to remove the old edifice, which is a small and ruinous structure, only about 45 feet long by 18 feet wide, without any architectural pretensions. The new church is in the Early Decorated style, and is to be dedicated to St. John the Evangelist. It is built of Bath, Tisbury, Melbury, and other stone, and consists of a nave, north and south aisles, and a chancel, on the north side of which is a tower, surmounted by a pointed bell-turret. The interior is about 104 feet in length, and 53 feet in width, and is fitted up with open stained deal benches to accommodate 365 persons. The pulpit and font are alike of stone, carved, and the general effect of the interior is enhanced by a stained glass east window. Mr. Wyatt, of London, was the architect; Mr. Miles, of Shaftesbury, the builder; and Mr. Howitt, of Wilton, clerk of the works.

Cirencester.—The new church of the Holy Trinity at Watermoor has been enlarged, and the unfinished designs of Mr. Scott have been completed. Dr. Warneford's trustees and the Diocesan Association made grants of 200*l.* and 70*l.* to insure free and open seats, which now accommodate 130 more persons, and the church has been re-opened. The church has been warmed by hot-air apparatus, furnished by Haden, of Trowbridge, at the cost of an anonymous benefactor, who presented 100*l.* for the purpose. There is some artistic carved work by Gefflowski, of Liverpool, in fruit, foliage, angelic figures, &c.

COUNTRY COTTAGES,—OVERCROWDED AND UNDRAINED.

A Berkshire magistrate, in a statement made at a recent dinner of the Faringdon Agricultural Library, gives particulars of a special examination into the state of the cottages of agricultural labourers of the district, which fully corroborates all we have said on the subject of such cottages generally; and he himself remarks that he is firmly convinced that this is but a fair sample of the condition of the agricultural labouring population of England. "Indeed," he adds, "I have been assured by farmers that the want of decent accommodation has for some time past been driving the superior class of peasantry to emigrate; and that, unless some reformation be brought about, none but the feeble and most ignorant will remain in places where decent lodging is not to be procured." So totally inadequate is the accommodation in most of these cottages, that it is quite common to find fathers and mothers, with grown-up, as well as younger, sons and daughters, the last of these with one, two, and even four illegitimate children, sleeping together, "pell-mell," as is remarked, in numbers varying from 5 or 6 to 8, and even 12, in one room!! Drains are generally a-wanting, or when laid, even worse than if a-wanting, as in flowing into a sitting-room, or emitting stenches at a front door. The whole state of matters is fearful, and, moreover it is most disgraceful to land-owners. In one instance, that of Longworth, it is said that "Most of the cottages in this village are very old, some of them scarcely fit to live in. (Said to be ecclesiastical property.)" At a time when so much attention is being paid to the breed, keep, and condition of horses, and other beasts, it is shocking to think of such neglect of human beings. Would not many land-owners and farmers find it to the advantage of their much-loved pockets were they to turn their ploughmen and their farm-women into the well built and ventilated, drained and cleaned stables and cow-houses, there to enjoy the society of the sleek, fat, and spirited animals of which they are so proud? The magistrate referred to (Mr. H. Tucker) suggests that "Surely the Act of Parliament which authorizes the Government to advance money to landed proprietors for the draining of land, erecting farm buildings, &c., might extend its provisions to the more important duty of housing the poor, if it were only with even half the comfort in which we house our cattle and our horses."

LINCOLN GRAMMAR-SCHOOL COMPETITION.

Designs have been sought for master's new residence. In reply ten were sent in, out of which five were selected for further consideration, bearing the following names and mottoes:—"Beta" (Mr. Giles); Mr. Drury, Lincoln; Mr. Goddard, Lincoln; "Ides," London (name not known); and one marked "Justice." The last was accepted by the visitors, and proved to be by Messrs. Bellamy & Hardy, of Lincoln.

CLIFTON COLLEGE COMPETITION.

The council having decided to confine the competition to the architects of Clifton and Bristol, issued their "instructions" in the first week of October, and invited all architects whose names appeared in the local directory to send in designs. The sum to be expended on the college alone is 10,000*l.* The author of the best design is to carry out the works at the usual per centage; and the authors of the second, third, and fourth-best designs are to receive respectively 50*l.*, 30*l.*, and 20*l.* In response to this invitation, upwards of twenty designs were sent in on the 28th ultimo. A sub-committee of the council was appointed to examine and report upon the designs submitted, and they afterwards called in the assistance of Mr. Benjamin Ferrey, architect. Ultimately the design of Mr. Charles Hansom was selected as the best. The second premium was awarded to Mr. Norton, the third to Mr. E. W. Godwin, and the fourth to Mr. T. R. Lysaght.

GLASGOW ARCHÆOLOGICAL SOCIETY.

At the usual monthly meeting of the Glasgow Archæological Society Mr. Robert Hart read a paper on "The Remains of an Ancient British Village near Busby, in Cathcart Parish." Numerous traces of these pit-houses are said to be found in Aberdeenshire, and on the bank of Lochfine, and other places. These are found rarely to exceed 8 feet in diameter. Those found at Overlie were of the kind called "Picts' houses" by Wilson and others. They were arranged in a convex crescent round the foot of the small hill—thirty-six in number—and on the flat top of it six, also in a curve. Those round the base of the hill were dug about 4½ feet deep into the hill, and averaged about 12 feet square. The sides of some were lined with a thin wall of stone: one or two had slabs of thin undressed stone set on end to support the earth sides: others had nothing but the natural soil for walls. There was a passage or entrance in the centre of one side in each, going in upon a level with the floor; but those on the top of the hill had an inclined passage down into them. The floors of them all were paved with irregular-shaped thin flag-stones, such as might be got in the bottom of the Cart. In the centre of the floor there was a hole or space left to hold the fire, and the remains of the fires were found in them.

Mr. James Fleming read a paper "On Certain Peculiarities of Scottish Heraldry;" and Dr. D. P. Stewart read the first of a paper "On a remarkable Drinking Cup used by the old Viscounts of Kilsyth; and on Arms used by a Glasgow Family, of the name of Muir, at the Battle of Prestonpans."

LONDON AND COUNTY BANK, LOMBARD STREET.

The contract for the superstructure of the proposed new building for the London and County Banking Company has been undertaken by Messrs. Jackson & Shaw, for the sum of 14,830*l.*, exclusive of the fittings. The basement, with its range of strong rooms, stationary departments, and lavatories, has been already completed by Messrs. Myers up to the street-level. The banking department will be fire-proof. The elevation in Lombard-street will be of Portland-stone, with rusticated Doric columns, as will also that in Nicholas-lane, up to the first floor, above which Jennings's patent facing bricks will be used, an experiment which will be worth watching. It should also be remarked that the whole of the stone to be employed will be obtained from old Westminster Bridge. Mr. C. Parnell is the architect.

THE HULL DRAINAGE QUESTION.

A rather stormy debate has taken place in the Hull Board of Health on the long mooted question of the west district drainage and the merits of the plan of Mr. Hawksley (supported by the local surveyor, Mr. Marillier), and that of Mr. C. F. Butler, the assistant surveyor, which, as our readers may recollect, is on the gravitating principle.

The debate arose upon a motion,—

"That the plan of Mr. Hawksley, C.E., for the drainage of the west district of this borough, together with his report of the 1st October, 1858, thereon, and presented to this Board on the 28th day of the same month of October, be, and the same are hereby adopted; and that all previous resolutions of this Board adopting any other plan of or for such drainage, and inconsistent with this resolution, be, and the same are hereby rescinded;"

and on an amendment to the effect,—

"That it be a direction to the Committee of Works to submit Mr. Butler's plan for the drainage of the west district of this borough to T. Page, esq., C.E., late Government inspector for Croydon, with instructions to report to the Committee on the following points, or on such of them as he may deem requisite, namely:—First—Whether in his judgment Mr. Butler's plan for the drainage of the west district, if carried out in the manner proposed by him, would prove efficient. Secondly—If in his opinion it would not,—whether he can suggest any alteration therein by which it might be made so. Thirdly—In the event of his coming to the conclusion that Mr. Butler's plan does not, in its present form, and cannot, be so amended as to afford a reasonable prospect of its result being satisfactory,—whether he can himself furnish the Committee with an independent plan for the effectual drainage of the west district on the principle of gravitation. Lastly—If able to supply such plan, what would be its general character, and the approximate cost of carrying it into execution; and that all other resolutions of the Board to the contrary be, and the same are, hereby rescinded."

Another form of amendment was proposed, embodying a suggestion that Mr. Hawksley's plan, as well as that of Mr. Butler, should be submitted to Mr. Page; that whatever decision Mr. Page might give with regard to either of them, should be final and binding upon the Board; and that, immediately upon receipt of Mr. Page's decision, the work should be proceeded with according to his report as to which was the best scheme.

In course of the debate it was asserted that there was in fact no plan other than a written one by Mr. Hawksley before the meeting, and that what plan there was had been so indefinite, that Mr. Marillier, the surveyor, had "mistaken the top for the bottom of it." This the surveyor denied; and it appeared that some slight misunderstanding only had occurred with regard to the invert and the crown of one of the sewers.

Very different opinions seemed to be entertained as to the east district drainage (on Mr. Butler's plan), some maintaining that it was very imperfect, and that the new Pearson park could not be properly drained by it.

After much talk and no little recrimination, the previous question was supported, and the clerk, on being appealed to on the effect of carrying this question, said that they would be in precisely the same position as they were before. There was a resolution on the books approving of Mr. Butler's plan, and another giving instruction to the Works Committee to carry it out. If they carried the previous question these resolutions would remain, and it would be for future action to be taken on them.

Finally the previous question was carried by a majority of 27 to 15.

ADULTERATION OF LINSEED OIL.

WE continue to receive letters showing the great want of pure oil. One correspondent says,—They are now putting common resin in it, which is very injurious to paint, and becomes tacky in a warm atmosphere. The white lead you generally get, no doubt, is ground up with bad oil. You cannot depend upon making a good job of flat painting: it will become glossy and patchy in a short time after it is done, though nothing but turpentine is used. The oil question is really a matter of importance. For inside work, the only sure mode of making a good job of plain painting is by using a little good elastic varnish and turpentine, instead of oil; but this is too expensive for work generally; although, if done in this manner, the work would last two or three times as long as the ordinary process of painting, and look much superior. It would be a good thing for the tradesmen and public if any one would publish the true and best mode of testing whether the oil is genuine or not.

THOMAS KERSHAW.

COMPETITIONS FOR STAINED GLASS.

I WAS glad to see in your number of the 1st instant some attention had been drawn to your extract of my letter, which appeared in your impression of the 10th ult., with reference to the making designs for stained glass more publicly competitive.

But the more I think what the effect of such a plan would be, the more I feel convinced that it would tend to raise the art of stained-glass designing, greatly higher than it at present stands.

I think it would give a great impetus to advanced students in Government Schools of Design, to have such a means open to them of showing their powers in designing; and even to attempt designs of this kind for other art manufacturers would also add to such impetus. To have a knowledge of the practical working out of such designs is, of course, very necessary; but I believe, generally speaking, with opportunities for learning, there is no great difficulty in attaining this knowledge, but often very much the reverse.

Another good that would result is, that it would allow young men to think and act more for themselves in this, and not be in any way hampered, as one so often hears they are, by what their employers may think or wish to do. At all events the plan is not likely to do any harm, and it might do much good. Why, then, should it not be attempted?

I still do not think the choosing, out of such designers for stained glass, the best idealist, colourist, and delineator, and if possible combining them to produce the window, would make the "miserable jumble" which your correspondent, "Peter," imagines. If good idea, colour, and drawing are found to exist most in one design, the designer thereof is certainly the man to be employed for the work; and a more satisfactory thing is likely to result than if three were employed at it. But such a man is as rarely to be found as hidden treasures. I believe more artists do possess these qualities than we are apt to suppose; but, in order to arrive at extraordinary perfection in one or two of them, the other one or two are neglected. Many aim at drawing, to the exclusion of the other two qualities, power at chiaroscuro and colouring, and many fewer at idea.

Of modern painters, Turner perhaps combined these three qualities to most perfection; but even his drawing seems to have been sometimes neglected so as to excel the more in idea and colour.

But to return. Out of many designs which might be submitted for a stained-glass window, let us suppose that none of them combined all the three qualities specified, or even two of them: my plan for making the most out of the number would be the following:—

Discover which design showed the most harmonious colouring, in doing which there would be no great difficulty; next that which showed the most correct drawing, in discovering which there would be more difficulty; and next, that which was the most rich in idea, to discover which might possibly be exceedingly difficult, for the richest ideas are very often the most subtle. For that reason a plain description of the artists' ideas would be necessary to accompany such a work, in order to avoid unnecessary delay in discovering the best idealist. It would also be essential, that those destined to decide on the merits of such works should either be artists, or men well versed in art. Let the general arrangement and ideas of the idealist be submitted to the correct delineator, and I think a subject rich in drawing and idea would result. If this, then, were submitted to the man who shows the innate quality of producing harmonious colouring—a quality so rarely seen in our enlightened age,—I believe a very perfect window would be the consequence.

Mr. Ruskin, in "Modern Painters," says,—"That art is greatest which conveys to the mind of the spectator, by any means whatsoever, the greatest number of the greatest ideas." This is true with regard to all works of fine art; and no doubt, properly to convey these ideas, proper execution is required; but I maintain that these ideas may be, and often are, conveyed by very inferior execution; and it is to obviate such deficiency that, where it is practicable, I would ask the assistance of another.

A STUDENT IN ART.

IMPROVEMENT OF IPSWICH.

I BEG leave to second the proposition of your correspondent respecting the improvement of Brook-street; and I have no doubt that all who look to Ipswich as the capital of their native county will, with the usual patriotism, concur in the same. A similar improvement is wanting at the east end of the butter-market, where it enters Brook-street; more especially now that the west end of the butter-market opens into the line of streets leading from the Eastern Counties Station. It is worth making a public subscription for, which would certainly be responded to in Ipswich; for a still greater improvement was effected in Colchester by the same means, though the population of this town is little more than one-half that of Ipswich.

W. SCARGILL.

BUILDING STONES.

IN your recent notice of Mr. Hunt's Statistics of Building Stones you do not mention an excellent Bath stone from *Murhill Down* quarry, which has lately come under my notice, and has been used in several of the buildings in Gloucester—the markets, the corn exchange, &c. For *outside* works it is the best weather stone that I have seen under the name of Bath stone, being composed chiefly of shelly or flinty-looking particles, very equably disposed throughout.

I should hope that his work makes mention of Painswick stone, dug from the Coteswold hills, about six miles south-east of Gloucester. I may describe it as an oolitic freestone, resembling wrought Caen stone in appearance, but with far better wearing properties: it is excellent for indoor-finished work, as well as for outdoor-work, when not used in projections such as bases, string courses, buttress slopes, label mouldings, &c., in which positions Murhill Down Bath is preferable, or a stone called Bisley in this neighbourhood, which is also used for the ashlar work on the ground line, "between wind and water," as the sailors would term it. The fine central tower, and other parts, of Gloucester Cathedral are built in this manner with the two stones, *Painswick* and *Bisley*.

If the Great Western Railway Company were to make a small branch-line from Stroud or Cirencester to Painswick and Bisley quarries, close at hand, these valuable building stones might rival the supplies of Caen and Bath stones in the London market.

W. H. E.

Mr. J. J. Roebuck, who writes to us to urge the goodness of the stone from the hills west of Huddersfield, remarks, with much truth, "When decay has taken place in a building such as Westminster Palace, the permanent remedy I believe to be in introducing carefully selected stones from the best quarries in the district from which the stone of the New Palace was supplied, rather than from any coating whatever applied to the whole building indiscriminately."

EXPERIMENTS ON THE PURIFICATION OF SEWAGE, AT CROYDON.

AFTER the discussions that have taken place, I need hardly say that the most effectual method by which the sewer water from large towns should be purified, before it passes into the rivers, has now become a matter of great and vital importance.

A correct and detailed account of the experiments which have been carried out during the last two years by the Croydon Local Board, under my direction, on a large scale and at much expense, may be of value to many other towns, which are probably now in equally difficult circumstances to those in which this rapidly-increasing district has been placed.

I will first state that no mechanical means have been adopted to mix the different deodorizing and disinfecting agents, hereinafter described, with the sewer water; but, as they were all applied in a liquid state, the intermixture was in most cases rapidly effected.

The flow of sewage water at Croydon varies with the state of the weather, from 600 to 1,400 gallons per minute; the whole amount discharged being from 800,000 to 1,400,000 gallons during the twenty-four hours;—a part of this, discharged during the night, being clean water.

The apparatus used during these experiments was of the simplest kind, consisting of two wooden cisterns, holding 500 gallons each, and two precipitating and filtering tanks, lined with brick, being each in length 320 feet; width, 45 feet; and depth, from 4 feet to 3 feet; each holding about 260,000 gallons. These tanks are subdivided by one longitudinal wall, and three transverse walls, besides perforated iron-plates, so placed as to contain a thickness of straw, gravel, and coke. They were generally worked alternately, so as to give time for substances held in suspension to precipitate, and also to facilitate the action of any chemical agents used to fix or separate the matter held in solution.

The water passes from these tanks into a culvert one-quarter of a mile long; and, at the time these experiments were made, also through about 1½ mile of open ditches before it entered the river. The water now passes over fields intersected with irrigating channels, to which I will not further allude,—a statement respecting these having already appeared in one of the daily papers.

In the following account of the different experiments, a statement of the peculiar effect produced by each is given: the general effect common to all is afterwards stated:—

The first trial was made with lime-water. 1,200 lbs. of lime were slaked daily in the cisterns, and then passed into a manhole situate in the sewer, 300 feet before it entered the tanks: this effectually deodorized the water passing into and from them, but gave a clouded and milky appearance to it; and before it reached the river there was a smell clearly perceptible, and a white deposit left on the sides of ditches. The expense of this process was about one guinea per day.

The second trial was made with perchloride of iron, made under the direction of Mr. Way, by dissolving iron rust in muriatic acid: this was applied at the same place, in quantities varying from 60 to 120 gallons per day, at a cost of 8d. per gallon. When the larger quantity was used, the water near the surface, after passing halfway down the tanks, became quite clear, and flowed from the end of the filters free from colour and smell: there was, however, a deposit formed on the weeds and branches on the sides of the ditches which became offensive. The water taken from the ditches was in a very different state from that taken at the end of filters; and this occasioned conflicting statements, as to its purity, which greatly perplexed those before whom the most contradictory evidence was given, by men of the highest character and respectability. The cost of this process was, on the average, four pounds per day.

The third trial was made with a deodorizing composition from the Walker Alkali Works, at Newcastle, consisting of a mixture of chloride of manganese and perchloride of iron, which was dissolved in the cisterns, and run into the manhole. This composition was very effectual in deodorizing, but did not clarify the waters so well as the perchloride of iron; but I think this was attributable to a defect in the temporary manufacturing apparatus fitted up hastily at Newcastle, which failed to give the proportion of perchloride of iron that was intended by the makers. The cost of this process was two pounds per day.

The fourth trial was made with limewater and fifty gallons of perchloride of iron. This was effectual in cleansing the water, but the same offensive matter was formed in the lower part of the ditches. The cost of this process was 2*l*. 10*s*. per day.

The fifth trial was made with Dale's magnetic muriate of iron, of which 100 gallons per day were used. The water, as it passed from the filter works, was nearly clear, but the same deposit was apparent in the ditches as previously described. The cost of this process was 4*l*. per day.

The sixth and last trial was made with one gallon of MacDougall's carbolic acid and lime to 40,000 gallons of sewer water. This removes all smell, and disinfects but does not clarify the water: this defect, being now, however, effectually remedied by the system of irrigation, is, in our case, of no consequence. The cost of this process is 18*s*. per day.

There is one general effect produced by all these agents, of a remarkable character. A large part of the solid matter, instead of subsiding to the bottom of the tanks, forms a floating crust on the surface of the first divisions, about 100 feet in length, which, in about six weeks, becomes 15 inches thick, and so solid that it is necessary to use spades and barrows for its removal: and if this is done at short intervals, the solid matter at the bottom of the tanks accumulates very slowly.

The manure from the surface just described is very valuable, and has been used this summer by our farmers in this neighbourhood, on meadow land and turnips, producing in one case four times

the effect of the same quantity of farm-yard manure.

There is no doubt that the water, after the application of any of these chemical agents, still holds in solution a quantity of fertilizing matter, which, although it may be rendered innoxious and imperceptible, should not be wasted, if it is possible to render it available by procuring land for irrigation.

After closely watching the state of the water during the before-mentioned trials, I am, however, decidedly of opinion, that, where land cannot be obtained for irrigation, the sewage, after being subjected to the action of deodorizing and disinfecting agents, and the solid matter separated by a succession of filters, should be then carried alternately into reservoirs capable of containing the twenty-four hours' flow; and, after being kept in them during that period to deposit the matter not separated by the filters, might afterwards be safely passed into any river, without discolouring it, or destroying the fish.

In no case can a disinfecting agent be safely omitted. I am quite aware that many of these chemical applications affect the value of the manure; but the health and comfort of those residing near sewage and irrigation works ought to be in every town a consideration of more importance than the mere money value of the refuse.

James Fenton,
Engineer to the Croydon Local Board.

DIRECT COMMUNICATION FROM SOUTH KENSINGTON TO BELGRAVIA.

A correspondent sends us the following. Without being prepared to advocate the formation of a railway in the position described, we gladly insert particulars which may interest many readers:—

Sir,—An opportunity now offers of making an important public improvement, namely, to connect Belgravia with South Kensington. I have examined the Parliamentary plans just deposited at the Chelsea Vestry Hall, for a line of railway direct from Oxford to London, which proposes to have the terminus adjoining Sloane-street, on the Pavilion ground, and close to Belgravia. The portion to which I would call attention is to start from a branch line that was passed last session for connecting South Kensington with the West London line, and its terminus is at the end of Cromwell-road, adjoining the estate of the Royal Commissioners, and within a few yards of the spot where the Exhibition of 1862 is proposed to be held. The proposed branch or line runs straight along Cromwell-road and the front of the Brompton Museum, through Michael's-place, the Grange, across Walton-street, by the new Police-station, across the Smiths' Charity land and the Pavilion grounds and Raquet-courts to Sloane-street, and would connect the proposed Cadogan Station with all the northern lines of railway. The company have scheduled a large portion of property on the line, including Yeoman's-row, the Grange, the Nursery, and the Pavilion estate, together with nearly all the houses opposite the Cadogan gardens, in Sloane-street, namely, from No. 67, down to Cadogan-street. It appears a bold stroke for the company to schedule so much valuable property; but, sir, I see in this plan an opportunity for continuing Cromwell-road, South Kensington, in a direct line to Chesham-place and Belgravia; and there is no reason why this might not be done by an arrangement with the Royal Commissioners and the proposed railway company, and so open up one of the most important lines of road in that part of London.

The railway is proposed to be carried under the road, in the same way as the Metropolitan line; and the road is only to be raised, near the Bell and Horns, at Brompton, about 18 inches, and the level of the Cromwell-road, in front of the Brompton Museum, to be left unaltered. The large space of vacant ground, together with the house property scheduled, cannot be much less than *fifty acres* of the best building land in London; and the proposed continuation of Cromwell-road to Sloane-street would form a direct communication from Buckingham Palace, through Belgravia and South Kensington, to Queen's Gate, Hyde-park, and Kensington Palace. Octavius.

GREEN PAPERHANGINGS.

The paragraph on poisoning by green paperhangings, which is at present going the round of the newspapers, is calculated materially to mislead the public, unless accompanied by some explanation. It is therein stated that the paper on the walls of a room inhabited by two children at the time they were attacked with an illness, from the effects of which one of them died, was a green flock paper, coloured with Scheele's green; and that, on analysis, the quantity of poisonous pigment contained therein was found to amount to nearly one-third the weight of the paper. It was further stated that the child died from the effects of inhaling the fumes of arsenic given off from the green colouring matter of this paper.

Now, the natural inference from this statement is, that green flock contains arsenic, and is consequently injurious when used in paperhangings. Such, however, is not the case: green flock is not coloured with Scheele's green, nor does it contain arsenic. In the instance referred to, the paper was a green "flock-pattern," printed on a green ground, which ground was prepared from Scheele's green, and would consequently contain a large proportion of arsenic. Your readers must not, however, suppose that, because Scheele's green contains arsenic, all greens are necessarily injurious.

Green is one of the most beautiful and pleasant colours that we possess, and is a colour that will always be largely used for decorative purposes. Nor is there the slightest reason that it should not be so used, as greens of almost any shade can be produced by compounding indigo and yellow; and, when so manufactured, are permanent in colour, are quite free from any injurious quality, and will cost very little more than Scheele's or other dangerous compounds. But even Scheele's green may be rendered innoxious, and may be used with perfect safety, if the paper to which it is applied be glazed with either satin-colour or varnish. The danger arising from the use of this pigment consists in the fact, that it is a colour very difficult to combine with size; and consequently, when used in large quantities in cheap paper hangings, it usually presents a loose rough surface, from which particles are apt to fall, if the paper be rubbed [but this evil satin or varnish will at once rectify]: these particles will float in the atmosphere, and of course are liable to be inhaled by any person inhabiting a room so papered. It is therefore to this cause alone that I would attribute evil consequences, when they do arise, from the use of this green; for I think few chemists will agree with a jury when they say that arsenic will evaporate from the walls of a room at the ordinary temperature of a dwelling-house. George Cooper.

*** We made this matter clear some time ago, but the repetition is evidently not uncalled for.

NORTHAMPTON TOWNHALL COMPETITION.

Sir,—It is matter of notoriety that the sons of two architects who are influential members of the Northampton corporation intend competing for the new Townhall.

Neither of these intending competitors is established in practice on his own account; and it can hardly be expected that, even with the best intentions, matters can be so arranged during the progress of the competition as to secure the secresy and impartiality which the other competing architects have a right to expect.

I am sorry to raise what may seem to be a personal question, but I think it will be conceded that these gentlemen stand in such a position, with respect to the judges of the competition, as to render it necessary that a clear understanding should be had as to the propriety of their competing at all. A Competitor.

THE PROGRESS OF THE MAIN DRAINAGE WORKS.

METROPOLITAN BOARD OF WORKS.

At a recent meeting of the Board, Mr. Bazalgette presented the following report:—

"During the past month little progress has been made in the main drainage works on the north side of the Thames. Works to the value of about 2,500*l.* have been executed in the Northern High Level Sewer; but they are for the present at a stand-still, for reasons already under the consideration of the Board.

The Northern Outfall Sewer cannot be commenced until we have obtained possession of the land, which at present we have been unable to do.

The tunnelling under Hyde-park and Kensington-gardens for the Ranelagh storm overflow progresses satisfactorily; the work approximating to the value of 4,300*l.* having been completed; and another length of 1,072 feet of underpinning of the Old Ranelagh Sewer has been finished, at a cost of about 2,300*l.*

The Southern Outfall Sewer works progress satisfactorily: the pumping engines for the Erith Marshes, and the tunnel under Woolwich, have turned out remarkably good, and the working is going on well. The value of the works completed is 967,000*l.*

Little progress has been made in the Low Level Sewer under the Surrey Consumers' Gas Company's yard, owing to the defective construction of a rotary engine erected by Mr. Aird, who is confident that he has now surmounted the difficulty, and entertains no doubt as to its ultimate efficiency. The east outlet works progress slowly but satisfactorily, and may now be valued at about 8,000*l.*

We are about to take possession of the land for the Deptford pumping engines; and the contract for the buildings and works in connection therewith will be ready to be laid before you very shortly.

The Southern High Level Sewer contract does not progress so rapidly as I could desire; nor are the bricks supplied so good as I could wish, and as we expect to obtain, although there is reason to believe the contractors desire to give satisfaction. Much allowance must be made for the very unfavourable weather for all building operations, more especially for underground works; and at this time of the year we do not expect to make greater progress. The work completed in this contract is rather more than three miles, and its value is about 54,000*l.*"

THE "BUILDER'S" LAW NOTES.

A Client's Responsibility.—If a solicitor write a letter purporting to be on behalf of a client, it is strong *primâ facie* evidence that it was written by the authority of the client, and it may be admitted in evidence against him.—*Bright* v. *Legerton.*

Importance of the exact Name in a Will.—A person left a legacy to "My niece Mary Frances Tyrwhitt Drake." He had no niece with those exact names; but he had a sister-in-law who bore all of them. It was proved that he was much attached to the same sister-in-law as well as to his nieces. The legacy was held null and void for uncertainty.—*Drake* v. *Drake.*

Apparent Ownership.—A shipbuilder being indebted to his brother assigned to him a ship then being built in his yard. The ship remained in the debtor's yard, but the creditor sent an agent to superintend the completion. Even after the ship was launched she remained in the debtor's yard to be fully completed. The debtor was declared a bankrupt, and it was decided that, in the absence of any proof of fraud in the transaction, the ship could not be deemed to be in the "order or disposition" of the bankrupt, though she did remain in his yard for completion.—*Holderness* v. *Rankin.*

Mortgage.—A mortgagor in possession, is held to be rightly restrained from removing from a worsted mill some engines, shafting, and other apparatus, comprised in a mortgage deed executed by the mortgagor, the mortgage having been proved to be an inadequate security for the amount due thereon.—*Ackroyd* v. *Mitchell.*

Repairing of Churches.—A trust-fund was created in 1705, for the benefit of a parish church. The parish was divided in 1852 into two ecclesiastical districts, each to have its own church. It was sought to apportion, rateably, the amount of the trust-fund for the benefit of each of the two district churches. It was decided, that the trustees could not be compelled to make such rateable apportionment, as the primary object of the charity was the old church; but that if any surplus remained, after paying for the repairs of the old church, it might be applied to the repair of the new church.—*Re the North Wingfield Charity.*

Books Received.

Railway Communication in London and the Thames Embankment. By C. B. Lane, LL.D. London: Ridgway, 1860.

The object of this pamphlet is to advocate the promotion of a high-level railway on the contemplated Thames embankment, the embankment itself being kept low. The railway would start from the Blackwall line, in the vicinity of the Minories, skirt the Thames, pass on the north side of Victoria-street,

"Curve round by Ebury-square to near Sloane-square, cross King's-road and the Fulham-road, near the Consumption Hospital; proceed thence to Boltons, New Brompton; and, crossing the old Brompton-road, near the London and Westminster Cemetery, pass along the fields in the vicinity of the Kensington Canal, to fall into the level of the Kensington railway, near its southernmost extremity."

It appears devised to do the utmost possible harm to the largest possible amount of property.

Quarles's Emblems. Illustrated by Charles Bennett and W. Harry Rogers. London: Nisbet & Co., Berners-street. 1861.

Quarles's quaint grave book was not written for the multitude. As he says in his dedication to Benlowes, "Eagles scorn so poor a game as flies." But for those who wish for the table a book out of which may be always dug a lesson, and matter for thought, here it is ready to their hand, increased in value by the illustrations of Mr. Charles Bennett and Mr. Harry Rogers. The first edition of Quarles consisted of a set of poems, written to accompany the symbolical designs of Hugo, which were for that purpose reproduced on copper, by Will. Marshall, the celebrated engraver of Milton's portrait. The poems soon acquired a vast popularity, and editions multiplied in innumerable quantities; but the illustrations, always deteriorating in quality, soon presented nothing more than bad copies of bad copies. The present illustrators have thrown overboard, almost without exception, the whole of the original designs; and rather offer a series of drawings to illustrate the poems, than a repetition of worn-out pictures, which the poems were intended to elucidate. Their object has been to produce an edition of Quarles, for the living nineteenth century, and not for the defunct seventeenth. The bibliomaniacs who rejoice over early editions will be opposed to it; but it is not intended for them, but for the public. The style of ornamentation adopted is that in use among the decorative artists of Quarles's time. Mr. Bennett and Mr. Rogers have ably co-operated to lend additional interest to the conceits of Francis Quarles.

The Play-Book of Metals. By John H. Pepper, F.C.S., A.Inst.C.E., &c. Illustrated with nearly 300 Engravings. London: Routledge & Co., Farringdon-street, 1861.

Mr. Pepper is well known to all former visitors at the Polytechnic, in Regent-street, as a popular and successful lecturer on chemistry and other sciences; and his "Boy's Play-Book of Science" met with a very cordial reception (which it well merited) from the public, young and old. His present very interesting volume is perhaps better adapted to old boys than young; but no one who has relished his previous efforts can fail to be both amused and instructed with the varied and well-described information which he now gives as to the metals and the mines whence they are derived. The volume includes personal narratives of visits to coal, lead, copper, and tin mines; much information, relating to alchemy, which is curious and

amusing, if not quite correct; and besides, it treats scientifically, as well as popularly, of the chemistry of all the fifty known metallic elements.

The results of Mr. Pepper's visits to coal mines are interesting, as they shed a light on the *dark* position of the poor miners, female as well as male, and show how such deadly explosions as those of recent occurrence take place, and how they could and should be prevented. He enters very fully into the peculiarities of such mining works, and illustrates what he says by rough but seemingly truthful sketches. We observe that he points special attention to the self-extinguishing safety-lamp (Simons's) of which we have ourselves just been speaking, as a hopeful aid in obviating explosions.

On the subject of iron the author treats no less fully, as well as of copper, lead, and tin, telling us all about their mines and their manufacture into market metals: of gold and silver, too, and of aluminium; and, indeed, of all the more important metals, there is abundant information, both interesting and instructive.

While treating of iron, the Bessemer process is described, and the author, we observe, expresses an opinion quite in accordance with that taken by us from the first; that, notwithstanding undue laudation in the outset, and undue depreciation in the long run, this process "will, in time, effect great improvements in the iron manufacture."

Under the head of lead is a *résumé* of what is known of the influence of water on lead, and lead on water, a subject which we were the first to bring before the public in a way to excite attention and lead to care and caution in the use of lead in water-supply.

Under the head of gold the author, while alluding to its modern abundance, takes care to prevent us running away with the idea that it is only in recent times that gold has been got in at least considerable abundance; King Solomon, as we are told in the Bible, having worked up 27 tons weight of gold, as the produce of a single year, on the adornment of the temple; and the tomb of Simandius, according to Diodorus, having been environed with a circle of gold 350 cubits about, and a foot and a half thick, a mass of gold of enormous value even at the present time: Semiramis, again, erected in Babylon three statues of gold, one 40 feet high, and weighing 1,000 Babylonian talents, with a table of gold 40 feet long and 12 feet broad, and weighing 50 talents. Gold, therefore, though probably not so very abundant as now that new accumulations have been added to the old (may not some of the gold of Solomon and Semiramis, by the way, be even now in circulation?) was by no means a scarce or rare article in times of old.

While treating of mercury and the beautiful colours which it yields, the author regrets, as every artist must do, the unstable nature of these colours. Vermilion, however, or sulphuret of mercury, is not so changeable as the iodide, neither is the red oxide. The iodide is the most beautiful of all, whether in its primrose robe or its scarlet attire. It is of a beautiful pale yellow while hot, but generally changes, in a very curious way, to a vivid scarlet, as it cools, or when it is even touched; yet we have obtained it ourselves of a yellow hue even while cold; and this yellow colour, as we have found, may be rendered comparatively fixed by repeatedly subliming the iodide of mercury on metallic zinc. A black colour will first be thus produced, but finally the beautiful pale yellow; and probably the scarlet colour may also be fixable in some such way, although we have not tried to do so. We may add, however, in aid of those artists or others who are personally in search of means to fix mercurial colours, that the bromiodide of mercury retains the yellow hue, though not so fixedly as the double iodide of mercury and zinc; but, by considerable pressure, it may be made scarlet, though only where pressed; and that a series of curious colours, ranging from pale yellow to deep sage-green, can be produced by combinations of mercury with iodine and phosphorus together. There is a somewhat curious fact with regard to colours produced from iron, which we some time since happened to discover, and which we may here note while on the subject of colours. Observing an artist-friend of some mark, on one occasion, cooking (as we may call it), some red oxide of iron on his parlour fire, the idea recurred to us that in precipitating oxide of iron from its muriate, by means of an alkali, the first precipitation had appeared to be very crude by comparison with a second precipitation of the same oxide, after being taken up again by muriatic acid, as it happened to be; and, on retrying the experiment, we found that, at each of several precipitations, the powder of red oxide of iron became finer and more subtle as well as more vivid in colour. How professional chemists would account for this curious fact we cannot imagine: it appears to be inconsistent with prevalent theory: nevertheless, it can be easily verified as a fact, and may lead those interested to further discoveries in the same direction,—a very interesting one when we keep in view the magnificent hues of subtle oxidation obtained—but only so obtained—on the surface of polished steel implements in the fire; and the beautiful prismatic hues which Bergmann got by forcibly subliming, in a strong heat, a little proto-muriate of iron. In repeating Bergmann's forgotten experiment, we may here add, as a curious circumstance, that we obtained round translucent scales, tough and bendable like talc, and scarcely distinguishable in appearance even from those of a fish. The sublimation was only got at a full red heat.

But we must have done with Mr. Pepper's "Play-book of Science," or rather with our own little Christmas by-play, in which its suggestive pages have led us to indulge. There are only one or two hints, as to correction of errors in old lore, which we may append to our otherwise unqualified approval of the volume. Bichloride of tin was not known among the old chymists as "liquor of Lebarius," but as "liquor of Libavius." Prince Geber was not merely said to have converted mercury into a solid, consisting, in fact, of oxide of mercury; but was said to have converted it into another solid, namely, gold; and he himself says that gold consists of pure quicksilver, "clear fixture," and "sulphur changed from what it was," as the "tinger" of the other elements. If he were not an alchymist, how did he come to know or believe that? After the opinions given by eminent modern chemists, from Davy downwards, as to the possibility of transmutation, the probable correctness of the idea or principle, and the also probable constitution of the metals in general, as actual compounds (see Graham, the present master of the Mint, in his "Chemistry," on the subject), rather than elements, which no eminent modern chemist has ever conceived them in reality to be, though obliged to regard them as such *till analyzed*,—in the face of all this, we may remark, Mr. Pepper's ridicule of the principle of transmutation is rather stale and antiquated; and he ought to reconsider the subject, without allowing himself to be biassed by the unquestionable impostures of so-called alchymists. On one other point we may add, that Dr. Dee did not consult his crystal while Kelly digested the revelations: it was Kelly who acted as Dee's "Scrier," descrier, or seer, and who saw the visions in the crystal; while Dee, as the master-magician, noted them down. Mr. Pepper wonders "how he could look *into* the stone," as the "crystal" was "a polished piece of cannel coal." What Kelly really looked into, however, was the depths of his own imaging faculty; and any fixed point, almost, for the eye to gaze upon, would have done nearly equally well.

Finally, let us add, Paterfamilias, who is meditating the perennial Christmas book-gift to his young hopefuls, cannot do better than place Mr. Pepper's "Play-book of Metals" on the list; and take a dip into it himself, too, on Christmas eve.

Miscellanea.

THE POST-OFFICE.—In the last financial year the expenditure was 1,905,568*l.*, besides 41,489*l.* for superannuation and compensation allowances, as compared with 1,854,808*l.* and 40,108*l.* in 1858-9; 1,776,041*l.* and 36,400*l.* in 1857-8; 1,610,325*l.* and 26,861*l.* in 1856-7; and 1,291,550*l.* and 23,500*l.* in 1855-6. The growth of expenditure in the five years consequently amounted to 579,866*l.* In the same period the income advanced from 2,767,201*l.* to 3,310,655*l.*, showing an advance of 543,454*l.*

STATUE OF AMERICA.—Mr. Edward Kuntze, of whose medallion portraits we spoke some time ago, has produced a statue of America which deserves a word of notice. America is represented as a female figure leaning upon a shield bearing an eagle, the shield resting upon the stump of a hewn tree, to indicate clearance, on the root of which are piled up fruits and other products of the country. The head-dress is a tiara of thirteen stars, representing the thirteen original States. She has a young, fresh countenance, with an air of beneficence, and with outstretched hand offers welcome to all. The arms, judging from photographs before us, are somewhat short. Mr. Kuntze's countrymen in England should aid him in the work.

LIVERPOOL CEMETERY COMPETITION.—Through want of indication, and under pressure of intimation on the part of an official that note-taking was forbidden, our reviewer did not see the whole of the designs. It appears there was a second room "elsewhere," containing nine sets of designs, some of them very good.

BROMPTON REFORM.—The ground has been cleared in Brompton-road of a block of dull, heavy houses with palings on the south side, and a large piece of vacant ground now exists for a new square between Knightsbridge and the Museum, which is being laid out with considerable energy. A correspondent writes,—"This square will present two permanent sanitary adjuncts, a livery stable and dung-yard at one corner, and a busy slaughter-house at another."

THE SEWAGE QUESTION.—An experiment has, it is said, been submitted, to practical test during the last eighteen months in Hyde, near Manchester, under a patent of Mr. B. Standen, of Salford, for deodorising and concentrating the material collected from petties and ashpits. It now assumes the shape, it appears, of "The Eureka Manure Essence," and is produced at Messrs. Standen & Co.'s agricultural chemical works, in Hyde. The manure collected is said to be greatly reduced in bulk and weight, and thus a saving effected in the cost of transport to the farmers, who receive it in a state of powder resembling guano. Joint-stock companies are to be established, it is said, to work the process in towns desirous of adopting it. The material seems to be similar to the Parisian poudrette, if we rightly understand this account of it.

THE FIRE BRICK TRADE AND THE FRENCH TREATY.—In the spring of this year a meeting of the various fire-brick and clay-retort manufacturers in Durham and Northumberland was held in the Chamber of Commerce in this town, to consider the probable effects of the commercial treaty with France on this now large and important branch of our local manufactures. Mr. Jos. Cowen, chairman of the Tyne Commissioners, was appointed a representative of the trade to visit Paris, and lay the case of the fire-brick makers before the commissioners. He did so, and we are now glad to learn, by the publication of the details of the treaty, that all the concessions asked for by Mr. Cowen have been granted. Fire-bricks, clay retorts, pipes, and all other articles usually made by fire-brick makers, are henceforth to be allowed to enter France entirely free of all duty. This will be a great boon to this branch of local industry, as hitherto some of the fire-clay goods entering France were charged with a duty of ninety per cent. Now they are free.— *Newcastle Chronicle.*

OPENING OF THE BOTANIC GARDEN AT DUBLIN TO THE PUBLIC.—A tract has been printed and circulated under the title of "The Royal Dublin Society and the Citizens of Dublin. Why should Exclusiveness and Sabbatarianism be the Rule at the Glasnevin Botanic Garden, whilst under Her Majesty, at Kew, Free Admission is the Rule on all the Days of the Week, and on Sunday? Issued by a Preliminary Committee formed for Promoting the Freer Opening of the Glasnevin Botanic Garden." The committee propose to memorialize the governmental department which has the supervision of the Royal Dublin Society, in the event of the Society refusing to the public privileges which they themselves exercise; but they are hopeful that an expression of the public feeling on the matter is all that will be required to place the Glasnevin Garden on some such footing as that at Kew.

THE LEICESTER ARCHITECTURAL AND ARCHÆOLOGICAL SOCIETY.—A *soirée* has been held by this society at Leicester, under the presidency of Lord John Manners, M.P. The assembly was a numerous one. The large room of the Temperance-hall, where the *soirée* was held, contained many objects of interest. Lord John Manners made some remarks on the development of archæological and architectural knowledge, and suggested that local architectural societies should give their formal opinion as to the style of the new Foreign Office. The Rev. Charles Boutell, M.A., delivered a lecture on "Mediæval Costume as Illustrated by Monumental Brasses." The lecture was illustrated by rubbings from brasses. A paper from Mr. F. W. Ordish, on "The Objects of Architectural and Archæological Societies," was then read. The Rev. J. H. Hill, of Cranoe, read a paper, from the pen of Mr. J. Gough Nichols, the historian, on "The State of Leicester in the Early Part of the Seventeenth Century." Mr. Thompson also read a paper on "Recent Discoveries illustrative of Roman Leicester."

Lincoln: Hospital Drainage.—Workmen are now engaged in laying down drainage pipes, at a great depth, from the Lincoln County Hospital, so that the refuse from this institution will be conveyed into a cistern near the Wong at the top of the racecourse, and will thus be made available for agricultural purposes. A diversity of opinion exists as to the policy of this measure. It is said that before long house-building may be commenced on the locality in which the hospital refuse is to be deposited.

The Rectory, Bacton, Suffolk.—This building is now fast approaching completion. A few days ago the Rev. A. B. Hemsworth provided a dinner for the workmen here employed,—about fifty. The style of the building is Elizabethan, with white brick facings. The roof is covered with tiles, laid in bands of different colours. Mr. Wetherden Young, of London, is the architect; Mr. Ephraim Rednall, of Stowmarket, the contractor; and Mr. T. H. Elliott, clerk of works.

Proposed Conference in Birmingham.—A conference is to be held in Birmingham, on Wednesday, the 23rd of January next. The object is to bring to bear on Government arguments which shall lead to the grant of public money towards the education of children who are neither criminals nor paupers, but whose parents are either unwilling or unable to provide them with it, partly or wholly, at their own expense. The promoters of the movement first lay it down as an axiom that the State ought to furnish education to those who have no other means of obtaining it; they next point out that this is a duty practically recognised in the case of pauper and criminal children, and then claim for "neglected and destitute" children in general a right to participate in the same advantage.

Cambridge Architectural Society.—The third meeting was held on the 29th of November, when the Rev. G. Williams gave an account of some of his ecclesiological discoveries in Georgia. The churches which he dwelt chiefly upon were those of Timothesmana and Daba. The former of these is a small cross church, with aisles and apsidal chancel, with north and south chapels. Daba is a small chapel, terminated in an apse. Both of these have many peculiarities, which he dwelt on at some length; and also noted the singular preservation they are in, notwithstanding the severe climate of the country. These churches are both situated in very remote parts, seldom visited by travellers, and no account has hitherto been issued of them.

University College Conversazione.—The *conversazione* given by the professors of University College, on Tuesday evening last, was very numerously attended, and passed off agreeably. The principal object of interest, beyond those abiding attractions which the University fortunately owns, was Mr. Frank Cropsey's fine picture, "Autumn on the Hudson." It needs sunlight; but, well illuminated as it was, it had a beautiful effect. When the graphic writer, who so well represented the *Times* during the visit of the Prince of Wales to America, was struck with the wonderful beauty of the "Indian Summer,"—was dazzled with the brilliant tints with which the foliage was dyed,—he could find nothing else to compare with it but Mr. Cropsey's picture, which he had seen in London. What painter could desire a finer compliment? And, more than that, the compliment is deserved.

The Street Railway Experiment at Pendleton, Manchester.—In reference to the new form of street railway (lately noticed by us), invented by Mr. John Haworth, of Old Trafford, and called "the perambulator street railway," which consists of flat tramways level with the street, and a middle line with a sunk groove into which a perambulating wheel, attached to any ordinary omnibus or other vehicle, is made to dip by pressure on a spring with the foot,—it is stated by a writer in the *Manchester Examiner* of 4th inst. that he has recently inspected it at Pendleton, and that the result is that he anticipates its early introduction and rapid extension in this country and on the Continent, as an improvement on other plans. The perambulatory apparatus, he says, can be attached to existing omnibuses at comparatively small cost, and the gauge of their wheels also adjusted, as they do not vary much from one standard. The driver finds no difficulty in dropping the perambulator into the groove, and the travelling of the 'bus is, of course, much smoother. The cost of the triple line, he adds, is said not to exceed 900*l.* per mile, while Mr. Train's involves an expense of fully three times that amount. What of the middle groove, however: how is it to be kept clear of mud and stones on macadamized roads?

Warming Street Railway Cars.—An invention for warming street cars has lately been applied to cars on the railroad, says *The American Railway Review*. A furnace is attached underneath, on which are placed draft-doors, regulated by the motion of the car, so that there is certain to be a strong draft in either direction. Pipes extend from the drum of the furnace up through the floor of the car and along the whole length of the seats, from which sufficient heat radiates to warm the interior comfortably. These pipes are so adjusted as not to consume any of the space necessary for the convenience of passengers.

Gas.—The Shipley gas consumers are agitating for a reduction in the price of gas, to which the gas company object that, taking an average of years, their dividends have not exceeded 5½ per cent.,—a very good reason for increasing them by reducing the price, but by no means a good one for refusing to do so. Mean time, not only are the street lamps unlighted at night, but a third part of the shopkeepers do not use gas. They might have a very tolerable substitute, mean time, in the mineral oil, or liquid gas, lamps, of which we may shortly have something more to say.—— The Birkenhead Commissioners are trying the experiment of lighting the cabins of their river steamers with gas, a quantity of which will be carried on board each steamer daily.

The Projected New Railway Works throughout the Country.—From the notices in the *London Gazette* we find that not fewer than 262 railway bills—all new, or next to new—will be ready for the consideration of Parliament in the forthcoming session, if the promoters perform the necessary preliminary conditions. Many of the lot, doubtless, will not go beyond publication in the *Gazette*, or a few steps farther; but still a good balance will remain to give employment to committees, lawyers, agents, engineers, surveyors, &c. Two hundred and sixty bills are a formidable number; but, on a closer examination, they will be found to involve very different results from the list of 1845. Few are heavy enterprises. For the most part they contemplate the extension of existing communications, or the fusion of existing companies.

England connected with France by Railway.—It is said that the Emperor of the French "has at last given his sanction" to the project invented by M. Favre, a Parisian engineer, for making a railway from Calais to Dover. This gigantic project comprises a tunnel under the Channel; length 19 miles. The engineer, referring to the intrusions of water in making the Thames Tunnel, states that nothing of that kind can be apprehended, as the ground is mostly hard rock. The company of speculators who have taken the matter up in Paris are estimating the utmost cost of the tunnel; and the works are to be executed at a fixed price, by contractors offering every guarantee of responsibility. The French Emperor's "sanction" is doubtless very requisite, on the French side, to the French speculators who are so anxious to "annex" us; but his sanction will scarcely do on the English side, however agreeable it may be for us to escape the roll of the Channel waves in crossing to the Continent.

Artificial Leather.—We lately took occasion to allude to endeavours to realize an idea suggested in the *Builder* on this subject; and we now extract the following remarks, in a condensed form, as to a farther step in progress, from the *Suffolk Chronicle*:—"To Ipswich belongs the honour of an invention to gather up vast heaps of rubbish in the shape of leather cuttings, parings, and shavings; and, by a peculiar process, partly chemical and partly mechanical, to reduce them to a pulpy mass, and mould them to any desired form for useful and ornamental purposes. A factory is now erected, and a company formed, bearing the name of the 'Patent Plastique Leather Company.' The goods manufactured are more durable, and 20 to 30 per cent. cheaper than all other leather goods. We have made inquiry into this new process, and find the leather may be made as pliant as India-rubber, or as hard as board, and becomes adapted to an endless variety of uses, as bands for machinery, buckets for pumps (having all the suction of leather, with ten-fold durability), and rubber for pencil-marks. It is eminently adapted for all kinds of architectural ornamentation, in-door or out, and is an excellent material for picture-frames, plain or gilded, not being liable to cast or break. It can be made of any colour, matching the grain of all dark wood so accurately that even a skilful workman would mistake it for carving. This most truly useful invention, we have no doubt, under the hand of its originator, Mr. R. Seager, will, ere long, take its rank among our staple manufactures.

The Architectural Photographic Society.—We are compelled to postpone report of general meeting held on Wednesday last.

The late Fatal Scaffold Accident in the City.—Mr. Humphreys, the coroner, has held an inquest at the London Hospital upon the body of James Royden, who lost his life on Monday by the accident which took place at the new stabling and repository now in the course of erection in Liverpool-street, City, for Mr. Stapleton, the livery-stable keeper. The coroner having briefly commented upon the evidence, the jury unanimously returned a verdict of accidental death.

Restoration of Linlithgow Palace.—The town council of Linlithgow warmly approve of the intention of the Crown officers to restore the ruins of the Palace. Plans have been prepared by Mr. Matheson. The Crown officers propose to roof in the whole of it, and rebuild those parts of the walls, turrets, and battlements partially thrown down, and, in fact, to restore the palace outwardly, and in appearance, as it existed in the year 1745, before it was destroyed by fire; and, further, that part of the palace, as shown in the plans, should be applied for Sheriff Court accommodation.

TENDERS

For four houses, to be built at East-hill, Wandsworth, for Capt. Durdin. Mr. W. G. Habershon, architect:—

Tyler	£5,095 0 0
Wardle & Baker	4,752 0 0
Jackson	4,750 0 0
Monday	4,690 0 0
Notley	4,590 0 0
J. & C. Todd	4,548 0 0
Brake	4,499 10 0
Turner & Son	4,499 0 0
Knapp & Son	4,460 0 0
Bish	4,390 0 0
G. Todd, jun.	4,344 0 0
Walker	4,300 0 0
Aviss & Sons	4,250 0 0
Bass	4,150 0 0
Adamson & Sons	3,959 0 0

For house, to be built at Ditton Marsh, for Mr. G. Sprague. Mr. Henry Walker, architect:—

Pettitt	£945 0 0
Wheatly	824 18 0
James Long	775 0 0
Matthews	757 0 0
Callingham	755 0 0
Johnson & Gilby	708 16 6

For a chapel-house, to be built at Lower Tooting. Mr. J. Stapelton, architect:—

Williamson	£740 0 0
Scott	650 0 0
Morris & Son	632 10 0
Gates	612 0 0

For the erection of farm offices, at Chiselborough, Somerset, for the Right Hon. the Earl of Ilchester. Mr. R. H. Shout, architect. Quantities supplied by Messrs. Lansdowne:—

Stower	£5,665 0 0
Ritson	4,174 2 9
Drake	3,863 0 0
Down	3,640 0 0
Perry	3,528 14 0
Spiller	3,430 0 0
Diment	3,245 0 0
Shewbrooks	2,922 0 0
Chinnocks	2,580 12 0
Dendle (accepted)	2,503 16 2

For "Lamb" public-house, and three cottages, adjoining Milton-street, Bethnal-green. Mr. Barrett, architect. Quantities supplied:—

Wilson	£2,165 0 0
Raby	2,147 0 0
Hill	2,132 0 0
Hack & Son	2,120 0 0
Turner & Sons	2,013 0 0
Love	1,755 0 0
Dobson	1,374 0 0

For finishing eight villas, at South Norwood, for Mr. G. Woods. Mr. J. P. Patman, architect. Quantities supplied:—

Macey	£3,650 0 0
Brake	3,332 10 0
Smith	3,300 0 0
Chandler	3,092 0 0
Cousins	2,998 10 0

For repairs and alterations to the "Duke of Wellington" public-house, Poplar, for Messrs. Truman, Hanbury, Buxton, & Co. Mr. W. E. Williams, architect:—

Brake	£111 0 0
Scott	103 14 0

For marine residence, lodge, and stables, at Dawlish, Devonshire. Mr. H. H. Collins, architect:—

	House and Fittings.	Lodge.	Stables.	Total.
	£.	£.	£.	£.
Wilcox & Woodley	7,490	295	1,080	8,775
Pollard	6,649	250	1,105	7,995
Thomas	6,443	299	996	7,738
Moass	6,059	350	1,199	7,609
Rafford	5,222	225	990	6,438
Matcham	5,296	300	830	6,426
Climie	4,523	369	1,095	5,988
Harvey	4,710	299	941	5,950